



Geotechnical Data Technical Report

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1. Introduction to Purple Line

The Maryland Transit Administration (MTA) is preparing an Alternatives Analysis and Draft Environmental Impact Statement (AA/DEIS) to study a range of alternatives for addressing mobility and accessibility issues in the corridor between Bethesda and New Carrollton, Maryland. The corridor is located in Montgomery and Prince George's Counties, just north of the Washington, D.C. boundary. The Purple Line would provide a rapid transit connection along the 16-mile corridor that lies between the Metrorail Red Line (Bethesda and Silver Spring Stations), Green Line (College Park Station), and Orange Line (New Carrollton Station). This *Geotechnical Data Technical Report* presents the analysis of geotechnical data that was summarized in the AA/DEIS. It describes the methodology used for the analysis and the results of that analysis.

This Technical Report presents the methodology and data used in the analyses documented in the Purple Line Alternatives Analysis/Draft Environmental Impact Statement. The results presented in this report may be updated as the AA/DEIS is finalized and in subsequent study activities.

1.1. Background and Project Location

Changing land uses in the Washington, D.C. area have resulted in more suburb-to-suburb travel, while the existing transit system is oriented toward radial travel in and out of downtown Washington, D.C. The only transit service available for east-west travel is bus service, which is slow and unreliable. A need exists for efficient, rapid, and high capacity transit for east-west travel. The Purple Line would serve transit patrons whose journey is solely east-west in the corridor, as well as those who want to access the existing north-south rapid transit services, particularly Metrorail and MARC commuter rail service.

The corridor has a sizeable population that already uses transit and contains some of the busiest transit routes and transfer areas in the Washington, D.C. metropolitan area. Many communities in the corridor have a high percentage of households without a vehicle, and most transit in these communities is bus service. Projections of substantial growth in population and employment in the corridor indicate a growing need for transit improvements. The increasingly congested roadway system does not have adequate capacity to accommodate the existing average daily travel demand, and congestion on these roadways is projected to worsen as traffic continues to grow through 2030.

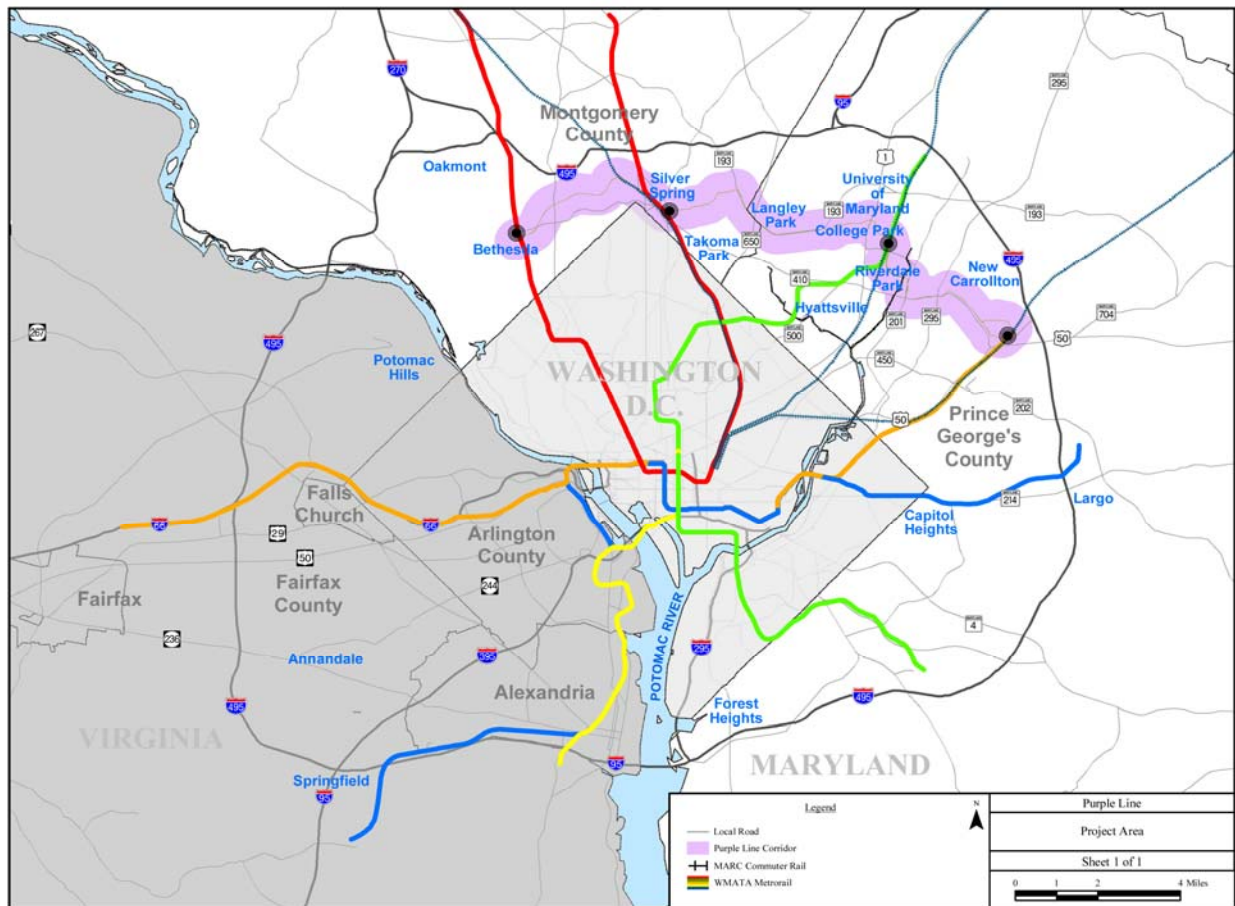
A need exists for high quality transit service to key activity centers and to improve transit travel time in the corridor. Although north-south rapid transit serves parts of the corridor, transit users who are not within walking distance of these services must drive or use slow and unreliable buses to access them. Faster and more reliable connections along the east-west Purple Line Corridor to the existing radial rail lines (Metrorail and MARC trains) would improve mobility and accessibility. This enhanced system connectivity would also help to improve transit efficiencies. In addition, poor air quality in the region needs to be addressed, and changes to the existing transportation infrastructure would help in attaining federal air quality standards.



1.1.1. Corridor Setting

The Purple Line Corridor, as shown in Figure 1-1, is north and northeast of Washington, D.C., with a majority of the alignment within one to three miles of the circumferential I-95/I-495 Capital Beltway.

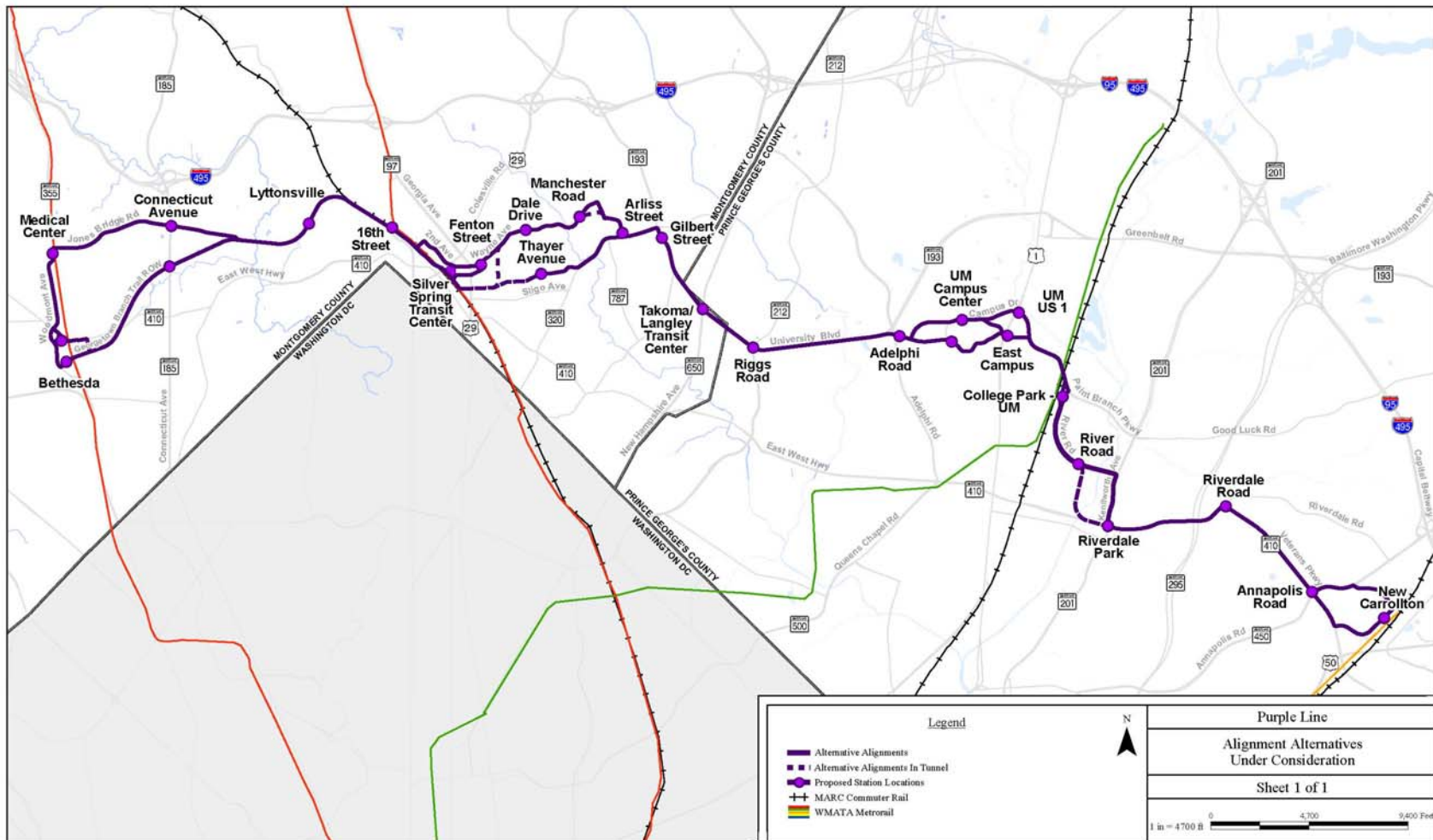
Figure 1-1: Project Area



1.2. Alternatives Retained for Detailed Study

The Purple Line study has identified eight alternatives for detailed study, shown on Figure 1-2. The alternatives include the No Build Alternative, the Transportation System Management (TSM) Alternative, and six Build Alternatives. The Build Alternatives include three using bus rapid transit (BRT) technology and three using light rail transit (LRT) technology.

Figure 1-2: Alternative Alignments





All alternatives extend the full length of the corridor between the Bethesda Metro Station in the west and the New Carrollton Metro Station in the east, with variations in alignment, type of running way (shared, dedicated, or exclusive), and amount of grade-separation options (e.g. tunnel segments or aerial). For purposes of evaluation, complete alignments need to be considered. These alternatives were used to examine the general benefits, costs, and impacts for serving major market areas within the corridor.

1.2.1. Alternative 1: No Build Alternative

The No Build Alternative is used as the baseline against which the other alternatives are compared for purposes of environmental and community impacts. The No Build Alternative consists of the transit service levels, highway networks, traffic volumes, and forecasted demographics for horizon year 2030 that are assumed in the local Constrained Long Range Plan of the local metropolitan planning organization (in this case, the Metropolitan Washington Council of Governments).

1.2.2. Alternative 2: TSM Alternative

The TSM Alternative provides an appropriate baseline against which all major investment alternatives are evaluated for the Federal Transit Administration's New Starts funding program. The New Starts rating and evaluation process begins when the project applies to enter preliminary engineering and continues through final design.

The TSM Alternative represents the best that can be done for mobility in the corridor without constructing a new transitway. Generally, the TSM Alternative emphasizes upgrades in transit service through operational and minor physical improvements, plus selected highway upgrades through intersection improvements, minor widening, and other focused traffic engineering actions. A TSM Alternative normally includes such features as bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, express and limited-stop service, signalization improvements, and timed-transfer operations.

1.2.3. Build Alternatives

The six Build Alternatives generally use the same alignments; only a few segments have locations where different roadways would be used. The differences between the alternatives are more often the incorporation of design features, such as grade separation to avoid congested roadways or intersections.

Alternative 3: Low Investment BRT

The Low Investment BRT Alternative would primarily use existing streets to avoid the cost of grade separation and extensive reconstruction of existing streets. It would incorporate signal, signage, and lane improvements in certain places. This alternative would operate mostly in mixed lanes with at-grade crossings of all intersections and queue jump lanes at some intersections. Southbound along Kenilworth Avenue and westbound along Annapolis Road, Low Investment BRT would operate in dedicated lanes. This is the only alternative that would operate on Jones Bridge Road, directly serving the National Institutes of Health and the National Naval Medical Center near Wisconsin Avenue and Jones Bridge Road. It is also the only



alternative that would use the bus portion of the new Silver Spring Transit Center (SSTC). A detailed description of the alternative follows.

From the western terminus in Bethesda, Low Investment BRT would originate at the Bethesda Metro Station bus terminal. The alignment would operate on Woodmont Avenue within the existing curb. At the Bethesda Station, the buses would enter the station via Edgemoor Road and exit onto Old Georgetown Road.

At Wisconsin Avenue, just south of Jones Bridge Road, the transitway would remain on the west side of the road in exclusive lanes. Low Investment BRT would turn onto Jones Bridge Road where the transit would operate in shared lanes with queue jump lanes westbound at the intersection with Wisconsin Avenue and westbound for the intersection at Connecticut Avenue. Some widening would be required at North Chevy Chase Elementary School.

The alignment would continue along Jones Bridge Road to Jones Mill Road where it would turn right (south) onto Jones Mill Road. Eastbound on Jones Bridge Road would be a queue jump lane at the intersection. From Jones Mill Road, the alignment would turn east onto the Georgetown Branch right-of-way, where a new exclusive roadway would be constructed, with an adjacent trail on the south side.

Low Investment BRT would continue on the Georgetown Branch right-of-way, crossing Rock Creek Park on a new bridge, replacing the existing pedestrian bridge. The trail would also be accommodated on the bridge or on an adjacent bridge. A trail connection to the Rock Creek Trail would be provided east of the bridge. The alignment would continue on the Georgetown Branch right-of-way until the CSX corridor at approximately Kansas Avenue.

At this point, the alignment would turn southeast to run parallel and immediately adjacent to the CSX tracks on a new exclusive right-of-way. The trail would parallel the transitway, crossing the transitway and the CSX right-of-way east of Talbot Avenue on a new structure and continuing on the north side of the CSX right-of-way. The transitway would continue on a new roadway between the CSX tracks and Rosemary Hills Elementary School and continue past the school. The transitway would cross 16th Street at -grade, where a station would be located. The transitway would continue parallel to the CSX tracks to Spring Street where it would connect to Spring Street and turn to cross over the CSX tracks on Spring Street. The alignment would continue on Spring Street to 2nd Avenue where it would turn east. Buses would operate in shared lanes on Spring Street and Second Avenue.

Low Investment BRT would cross Colesville Road at-grade and continue up Wayne Avenue to Ramsey Street, where the buses would turn right to enter the SSTC at the second level.

The buses would leave the SSTC and return to Wayne Avenue via Ramsey Street. Low Investment BRT would continue east on Wayne Avenue in shared lanes. After crossing Sligo Creek Parkway, the alignment would operate in shared lanes.



At Flower Avenue, the alignment would turn left (south) onto Arliss Street, operating in shared lanes to Piney Branch Road. At Piney Branch Road, the alignment would turn left to continue in shared lanes to University Boulevard.

Low Investment BRT would follow University Boulevard to Adelphi Road. The lanes on University Boulevard would be shared. At Adelphi Road, the alignment would enter the University of Maryland (UM) campus on Campus Drive. The alignment would follow the Union Drive extension, as shown in the UM Facilities Master Plan (2001-2020), through what are currently parking lots. The alignment would follow Union Drive and then Campus Drive through campus in mixed traffic and the main gate to US 1.

Low Investment BRT would operate on Paint Branch Parkway to the College Park Metro Station in shared lanes. The alignment would then follow River Road to Kenilworth Avenue in shared lanes. Along Kenilworth Avenue, the southbound alignment would be a dedicated lane, but northbound would be in mixed traffic.

The alignment turns east from Kenilworth Avenue on East West Highway (MD 410) and continues in shared lanes on Veterans Parkway. This alignment turns left on Annapolis Road and then right on Harkins Road to the New Carrollton Metro Station. The westbound alignment on Annapolis would be dedicated, but the eastbound lanes would be shared.

Alternative 4: Medium Investment BRT

Alternative 4, the Medium Investment BRT Alternative, is, by definition, an alternative that uses the various options that provide maximum benefit relative to cost. Most of the segments are selected from either the Low or High Investment BRT Alternatives.

This alternative follows a one-way counter-clockwise loop from the Georgetown Branch right-of-way onto Pearl Street, East West Highway, Old Georgetown Road, Edgemoor Lane, and Woodmont Avenue and from there onto the Georgetown Branch right-of-way under the Air Rights Building. The buses stop at both the existing Bethesda Metro Station on Edgemoor Lane and at the new southern entrance to the Metro station under the Air Rights Building.

The alignment continues on the Georgetown Branch right-of-way with an aerial crossing over Connecticut Avenue and a crossing under Jones Mill Road.

This alignment, and all others that use the Georgetown Branch right-of-way, includes construction of a hiker-biker trail between Bethesda and the SSTC.

The alignment would continue on the Georgetown Branch right-of-way until the CSX right-of-way. The alignment would cross Rock Creek Park on a new bridge, replacing the existing pedestrian bridge. The trail would also be accommodated on the bridge or on an adjacent bridge. The alignment would continue on the Georgetown Branch right-of-way until the CSX corridor at approximately Kansas Avenue. This segment of the alignment, from Jones Mill Road to the CSX corridor, would be the same for all the alternatives.



As with Low Investment BRT, this alternative would follow the CSX corridor on the south side of the right-of-way, but it would cross 16th Street and Spring Street below the grade of the streets, at approximately the same grade as the CSX tracks. The station at 16th Street would have elevators and escalators to provide access from 16th Street.

After passing under the Spring Street Bridge, Medium Investment BRT would rise above the level of the existing development south of the CSX right-of-way. East of the Falklands Chase apartments, Medium Investment BRT would cross over the CSX tracks on an aerial structure to enter the SSTC parallel to, but at a higher level than, the existing tracks.

After the SSTC, Medium Investment BRT would leave the CSX right-of-way and follow Bonifant Street at-grade, crossing Georgia Avenue, and just prior to Fenton Street turn north toward Wayne Avenue. The alignment would continue on Wayne Avenue in shared lanes with added left turn lanes to Flower Avenue and then Arliss Street. At Piney Branch Road, the alternative would turn left into dedicated lanes to University Boulevard.

Medium Investment BRT would be in dedicated lanes on University Boulevard with an at-grade crossing of the intersections. The alignment would continue through the UM campus in dedicated lanes on Campus Drive and then continue at grade in a new exclusive transitway through the parking lots adjacent to the Armory and turns on to Rossborough Lane south of the Visitor's Center.

Crossing US 1 at grade, Medium Investment BRT would pass through the East Campus development on Rossborough Lane to Paint Branch Parkway. The alignment would continue on Paint Branch Parkway and River Road in shared lanes, as with Low Investment BRT. At Kenilworth Avenue, both lanes would be dedicated.

Turning left on East West Highway, Medium Investment BRT would be in dedicated lanes. As with Low Investment BRT, this alternative would travel in shared lanes on Veterans Parkway.

Medium Investment BRT would continue on Veterans Parkway to Ellin Road, where it would turn left into dedicated lanes to the New Carrollton Metro Station.

Alternative 5: High Investment BRT via Master Plan Alignment

The High Investment BRT Alternative is intended to provide the most rapid travel time for a BRT alternative. It would make maximum use of vertical grade separation and horizontal traffic separation. Tunnels and aerial structures are proposed at key locations to improve travel time and reduce delay. When operating within or adjacent to existing roads, this alternative would operate primarily in dedicated lanes. Like Medium Investment BRT, this alternative would serve the Bethesda Station both at the existing Bethesda bus terminal at the Metro station and at the new south entrance to the Metro station beneath the Apex Building.

High Investment BRT would follow a one-way loop in Bethesda from the Master Plan alignment onto Pearl Street, then travel west on East West Highway and Old Georgetown Road into the Bethesda Metro Station bus terminal, exit onto Woodmont Avenue southbound, and then



continue left under the Air Rights Building to rejoin the Georgetown Branch right-of-way. Elevators would provide a direct connection to the south end of the Bethesda Metro Station in the tunnel under the Air Rights Building.

High Investment BRT would be the same as Medium Investment BRT until it reaches the CSX corridor. As with the Low and Medium Investment BRT Alternatives, this alternative would follow the CSX corridor on the south side of the right-of-way, but it would cross 16th Street and Spring Street below the grade of the streets, at approximately the same grade as the CSX tracks. The station at 16th Street would have elevators and escalators to provide access from 16th Street.

The crossing of the CSX right-of-way would be the same as for Medium Investment BRT. From the SSTC, High Investment BRT would continue along the CSX tracks until Silver Spring Avenue, where the alignment would turn east entering a tunnel, passing under Georgia Avenue, and turning north to Wayne Avenue. The alignment would return to the surface on Wayne Avenue near Cedar Street. It would continue on Wayne Avenue in dedicated lanes, crossing Sligo Creek Parkway, and entering a tunnel approximately half-way between Sligo Creek and Flower Avenue, then turning east to pass under Plymouth Street, crossing under Flower Avenue, and emerging from the tunnel on Arliss Street.

High Investment BRT would be the same on Piney Branch Road and University Boulevard except that the alignment would have grade-separated crossings over New Hampshire Avenue and Riggs Road.

Approaching UM, the alignment would cross under Adelphi Road. After Adelphi Road, the alignment would follow Campus Drive and turn onto the proposed Union Drive extended. The alignment would enter a tunnel while on Union Drive, prior to Cole Field House, and pass through the campus under Campus Drive. After emerging from the tunnel east of Regents Drive, the alignment would be the same as Medium Investment BRT, until Paint Branch Parkway.

The alignment would continue east on Paint Branch Parkway in shared lanes to the College Park Metro Station. The alternative would then follow River Road in dedicated lanes.

From River Road near Haig Drive, the alignment would turn right and enter a tunnel heading south, roughly parallel to Kenilworth Avenue. Near East West Highway (MD 410), the alignment would turn left and continue in the tunnel under Anacostia River Park. The alignment would transition to a surface alignment west of the Kenilworth Avenue/East West Highway intersection. The alternative would follow East West Highway in dedicated lanes.

High Investment BRT would turn right down Veterans Parkway in dedicated lanes. Unlike Medium Investment BRT, this alignment would cross under Annapolis Road before continuing on to Ellin Road.

Alternative 6: Low Investment LRT

The Low Investment LRT Alternative would operate in shared and dedicated lanes with minimal use of vertical grade separation and horizontal traffic separation. All LRT Alternatives would



serve only the south entrance of the Bethesda Station and would operate there in a stub-end platform arrangement.

Low Investment LRT would begin on the Georgetown Branch right-of-way near the Bethesda Metro Station under the Air Rights Building. The hiker-biker trail connection to the Capital Crescent Trail would not be through the tunnel under the Air Rights Building, but rather through Elm Street Park on existing streets. The terminal station would be the Bethesda Metro Station with a connection to the southern end of the existing station platform.

After emerging from under the Air Rights Building, the transitway would follow the Georgetown Branch right-of-way, crossing Connecticut Avenue at-grade and crossing under Jones Mill Road. Between approximately Pearl Street and just west of Jones Mill Road, the trail would be on the north side of the transitway; elsewhere it would be on the south side.

The segment from Jones Mill Road to Spring Street in the CSX corridor would be the same as for Low and Medium Investment BRT.

After crossing Spring Street, Low Investment LRT would be the same as the Medium and High Investment BRT Alternatives.

Low Investment LRT would be the same as Medium Investment BRT from the SSTC to Bonifant Street to Wayne Avenue.

Turning right, Low Investment LRT would continue at-grade on Wayne Avenue in shared lanes, crossing Sligo Creek Parkway and entering a tunnel from Wayne Avenue to pass under Plymouth Street. As with High Investment BRT, the alignment emerges from the tunnel on Arliss Street.

The Low Investment LRT Alternative would then follow Piney Branch Road and University Boulevard at-grade in dedicated lanes. In keeping with the low investment definition of this alternative, the major intersections of New Hampshire Avenue and Riggs Road would not be grade-separated.

As this alternative approaches Adelphi Road, the grade of the existing roadway is too steep for the type of LRT vehicles being considered. For this reason, the transitway would cross the intersection below grade.

At Adelphi Road, the alignment would enter the UM campus on Campus Drive. The alignment would follow the same alignment to the College Park Metro Station as described for Medium Investment BRT.

From the College Park Metro Station to the terminus at the New Carrollton Metro Station, Low Investment LRT would be in dedicated lanes on River Road. On Kenilworth Avenue, the LRT would be in a dedicated lane southbound, but a shared lane northbound. On East West Highway, the LRT would be in dedicated lanes with shared left turn lanes and in shared lanes under Baltimore-Washington Parkway. On Veterans Parkway, the LRT is in dedicated lanes.



As with Low Investment BRT, this alignment turns left on Annapolis Road from Veterans Parkway and then right on Harkins Road to the New Carrollton Metro Station. The segments on Annapolis Road and Harkins Lane would be dedicated.

Alternative 7: Medium Investment LRT

Medium Investment LRT is the same as Low Investment LRT from Bethesda to the CSX corridor, except that the alignment would cross over Connecticut Avenue.

Along the CSX corridor, the alignment would be the same as High Investment BRT, grade-separated (below) at 16th and Spring Streets. The alignment would be the same as Medium and High Investment BRT and Low Investment LRT from Spring Street through the SSTC.

From the SSTC, the alignment would follow Bonifant Street in dedicated lanes to Wayne Avenue. On Wayne Avenue, this alternative would be in shared lanes with added left turn lanes. The alignment would be the same as Low Investment LRT until Annapolis Road. The LRT would follow River Road, Kenilworth Avenue, East West Highway, and Veterans Parkway in dedicated lanes. At the intersection of Veterans Parkway and Annapolis Road the LRT continues across Annapolis, turning left at Ellin Road still in dedicated lanes.

Alternative 8: High Investment LRT

Alternative 8, High Investment LRT, would be the same as the High Investment BRT Alternative, except for the Bethesda terminus. The alignment would begin just west of the tunnel under the Air Rights Building. The hiker-biker trail would follow the alignment through the tunnel under the Air Rights Building. Because of physical constraints, the trail would be elevated above the westbound tracks. The trail would return to grade as it approaches Woodmont Avenue. The terminal station would be the Bethesda Metro Station with a connection to the southern end of the existing station platform.

1.2.4. Design Options

North Side of CSX

This design option is based on the Georgetown Branch Master Plan. From the eastern end of the Georgetown Branch right-of-way, the alignment would cross under the CSX corridor and then continue down the north side. It would emerge from the tunnel near Lyttonsville Road in Woodside. The alignment would be below the grade of 16th Street, passing under the bridge, but providing a station at that location. It would also pass under the Spring Street Bridge but would begin to rise on an aerial structure over the CSX right-of-way 1,000 feet northwest of Colesville Road due to the location of the Metro Plaza Building. The aerial structure over the CSX right-of-way would provide the required 23-foot clearance from top of rail to bottom of structure. The alternative would enter the SSTC parallel to, but at a higher level than, the existing tracks.

South Side of CSX with a Crossing West of the Falklands Chase Apartments

This option would operate on the south side of the CSX, as described either at or below grade at 16th Street. The alignment would cross the CSX corridor between Spring Street and Fenwick

Lane. This option would continue along the north side of the CSX right-of-way on an aerial structure over the CSX right-of-way 1,000 feet northwest of Colesville Road, due to the location of the Metro Plaza Building. The aerial structure over the CSX right-of-way would provide the required 23-foot clearance from top of rail to bottom of structure. The alternative would enter the SSTC parallel to, but at a higher level than, the existing tracks.

Silver Spring/Thayer Tunnel

This design option would begin at the SSTC where the alignment leaves the CSX corridor near Silver Spring Avenue. It would enter a tunnel on Silver Spring Avenue passing under Georgia Avenue and Fenton Street. At approximately Grove Street, the alignment would shift northward to continue under the storm drain easement and backyards of homes on Thayer and Silver Spring Avenues. The transitway would emerge from the tunnel behind the East Silver Spring Elementary School on Thayer Avenue and follow Thayer Avenue across Dale Drive to Piney Branch Road. If the mode selected were LRT, the grade of Piney Branch Road would require an aerial structure from west of Sligo Creek and Sligo Creek Parkway and would return to grade just west of Flower Avenue. This aerial structure requires that the road be widened. For this design option, a station would be located on Thayer Avenue where the alignment would emerge from the tunnel.

Preinkert/Chapel Drive

The Preinkert/Chapel Drive design option is being evaluated for both BRT and LRT through the campus of UM. The alignment would run from the west on Campus Drive turning right onto Preinkert Drive where it would head southeast. The transitway would turn left to pass directly between LeFrak Hall and the South Dining Campus Hall and then northeast through the Lot Y parking lot. From there, the alignment would run east along Chapel Drive between Memorial Chapel and Marie Mount Hall and eventually would pass to the south of Lee Building at Chapel Fields. The alignment would continue onto Rossborough Lane, passing directly north of Rossborough Inn to cross US 1, and continues east through the East Campus development.

1.2.5. Stations and Station Facilities

Between 20 and 21 stations are being considered for each of the alternatives. Table 1-1 provides the stations for each of the Build Alternatives.

Table 1-1: Stations by Alternative

Segment Name	Low Invest. BRT	Medium Invest. BRT	High Invest. BRT	Low Invest. LRT	Medium Invest. LRT	High Invest. LRT
Bethesda Metro, North Entrance	Yes	Yes	Yes	N/A	N/A	N/A
Medical Center Metro	Yes	N/A	N/A	N/A	N/A	N/A
Bethesda Metro, South Entrance	N/A	Yes	Yes	Yes	Yes	Yes
Connecticut Avenue	Yes	Yes	Yes	Yes	Yes	Yes
Lyttonsville	Yes	Yes	Yes	Yes	Yes	Yes
Woodside/16 th Street	Yes	Yes	Yes	Yes	Yes	Yes



Table 1-1: Stations by Alternative

Segment Name	Low Invest. BRT	Medium Invest. BRT	High Invest. BRT	Low Invest. LRT	Medium Invest. LRT	High Invest. LRT
Silver Spring Transit Center	Yes	Yes	Yes	Yes	Yes	Yes
Fenton Street	Yes	Yes	N/A	Yes	Yes	N/A
Dale Drive	Yes	Yes	Yes	Yes	Yes	Yes
Manchester Road	Yes	Yes	Yes	Yes	Yes	Yes
Arliss Street	Yes	Yes	Yes	Yes	Yes	Yes
Gilbert Street	Yes	Yes	Yes	Yes	Yes	Yes
Takoma/Langley Transit Center	Yes	Yes	Yes	Yes	Yes	Yes
Riggs Road	Yes	Yes	Yes	Yes	Yes	Yes
Adelphi Road	Yes	Yes	Yes	Yes	Yes	Yes
UM Campus Center	Yes	Yes	Yes	Yes	Yes	Yes
US 1	Yes	N/A	N/A	N/A	N/A	N/A
East Campus	N/A	Yes	Yes	Yes	Yes	Yes
College Park Metro	Yes	Yes	Yes	Yes	Yes	Yes
River Road	Yes	Yes	Yes	Yes	Yes	Yes
Riverdale Park	Yes	Yes	Yes	Yes	Yes	Yes
Riverdale Heights	Yes	Yes	Yes	Yes	Yes	Yes
Annapolis Road	Yes	Yes	Yes	Yes	Yes	Yes
New Carrollton Metro	Yes	Yes	Yes	Yes	Yes	Yes

The design of the Purple Line stations has not been determined at this stage of the project; however, the stations would likely include the following elements: shelters, ticket vending machines, seating, and electronic schedule information. The stations would be located along the transitway and would be on local sidewalks or in the median of the streets, depending on the location of the transitway. Because both the BRT and LRT vehicles under consideration are “low floor,” the platforms would be about 14 inches above the height of the roadway. The platforms would be approximately 200 feet long and between 10 and 15 feet wide, depending on the anticipated level of ridership at each particular station. No new parking facilities would be constructed as part of the Purple Line. Municipal parking garages exist near the Bethesda and Silver Spring Metro Stations, and transit parking facilities exist at the College Park and New Carrollton Metro Stations.

Additional kiss-and-ride facilities would be considered at the stations at Connecticut Avenue on the Georgetown Branch right-of-way and Lyttonsville. The SSTC, College Park Metro Station, and New Carrollton Metro Station already have kiss-and-ride parking facilities available and the Purple Line would not add more. It has been determined that kiss-and-ride facilities are not needed at the Takoma/Langley Transit Center.

1.2.6. Maintenance and Storage Facilities

LRT and BRT both require maintenance and storage facilities; however, the requirements in terms of location and size are not the same. LRT requires a facility located along the right-of-



way while a BRT facility can be located elsewhere. Depending on the construction phasing and mode chosen, two maintenance facilities (one in Montgomery County and one in Prince George's County) are ideal.

The size of the facility depends on the number of vehicles required. A fleet of 40 to 45 LRT vehicles or 40 to 60 buses (including spares) would require approximately 20 acres. The Purple Line would also require storage for non-revenue vehicles and equipment such as: maintenance, supervisory, and security vehicles.

Activities at the maintenance facility would include:

- Vehicle Storage area (tracks for LRT)
- Inspection/Cleaning
- Running Repairs
- Maintenance/Repair
- Operations/Security
- Parking
- Materials/Equipment Storage
- Two sites improve operations by providing services and storage near the ends of the alignment. It is possible to have one site provide the majority of the services and the other function as an auxiliary site.

Five potential sites were identified during the course of the alternatives analysis and were evaluated for environmental impacts. As part of the screening process, three were eliminated from further consideration. These five sites are listed below:

- Lyttonsville – This is a maintenance facility on Brookville Road in Lyttonsville, currently used by Montgomery County Ride On buses and school buses. The Purple Line would require the use of some additional adjacent property.
- Haig Court – This site is located on River Road at Haig Court. It would require minimal grading, but is partly wooded, and is very close to the residential neighborhood of Riverdale, which is also a historic district.
- North Veterans Parkway – This site is located on the north side of Veterans Parkway. This site is heavily wooded and includes steep grades.
- Glenridge Maintenance Facility – This site is located on the south side of Veterans Parkway near West Lanham Shopping Center. It is currently being used as a maintenance facility for Prince George's County Park vehicles.
- MTA New Carrollton property – This site is a parcel owned but the MTA on the east side of the New Carrollton Metro station. It is not particularly well located for use by the



Purple Line because it would require the Purple Line to pass under or around the New Carrollton Metro Station.

The Lyttonsville site and the Glenridge Maintenance Facility were identified as the two sites most appropriate for maintenance and storage facilities for the project based on potential environmental effects and location. These two sites would provide sufficient capacity for either BRT or LRT operations; and are well located near either end of the alignment.

1.2.7. Traction Power Substations

Light rail's electric traction power system requires electrical substations approximately every 1.25 miles, depending on the frequency and size of the vehicles. These substations, which are approximately 10 feet by 40 feet, do not need to be immediately adjacent to the tracks. This flexibility means the substations can be located to minimize visual intrusions and can be visually shielded by fencing, landscaping, or walls, or can be incorporated into existing buildings. The number and location of these substations will be determined during the preliminary engineering phase of project development.

2. Geotechnical Investigations

This report covers investigations for the underground sections under consideration in Chevy Chase, Silver Spring, College Park, and Riverdale Park. In Chevy Chase, the underground section is a below-grade street crossing. Multiple tunnel alternatives were investigated in Silver Spring and College Park. A single tunnel option was investigated in Riverdale Park.

Chevy Chase Underground Section

In Chevy Chase, a below-grade crossing is under investigation where the Purple Line would cross Jones Mill Road, as indicated in Figure 2-1. In this area, the Purple Line would be in the Georgetown Branch right-of-way.

Silver Spring Underground Alternatives

In Silver Spring, three alignments with tunnel sections were investigated. These alignments are a Sligo Avenue alignment, a Silver Spring/Thayer Avenue Alignment, and a Wayne Avenue alignment. All three of these alignments are between the Silver Spring Transit Center and Piney Branch Road and Arliss Street. All of these alignments included tunnel sections at the time of this investigation. Figure 2-2 shows a detailed map of the Silver Spring area with these alignments indicated in dashed lines.

The Sligo Avenue alignment extends southeast from the Silver Spring Transit Center to the intersection of Georgia Avenue and Sligo Avenue, continues along Sligo Avenue to Piney Branch Road, and then extends north along Piney Branch Road across Sligo Creek. For this alignment, the tunnel section begins west of the intersection of Georgia Avenue and Sligo Avenue, extends the length of Sligo Avenue and north along Piney Branch ending near the intersection of Piney Branch Road and Dale Drive. This alignment then becomes a surface alignment with a bridge over Sligo Creek and is a surface alignment for the remainder of length along Piney Branch Road, as shown in Figure 2-2. The approximate tunnel length for this alignment is 6400 linear feet.

The Silver Spring/Thayer Avenue alignment extends southeast from the Silver Spring Transit Center to Silver Spring Avenue, east under Silver Spring Avenue to Fenton Street, then shifts north slightly to continue further east between Silver Spring Avenue and Thayer Avenue, and finally emerges from the tunnel on Thayer Avenue, and continues east to Piney Branch Road along Thayer Avenue, as shown in Figure 2-2. The tunnel section begins at the west end of Silver Spring Avenue and extends east until the alignment connects back to Thayer Avenue. The approximate tunnel length for this alignment is 3600 linear feet.

The Wayne Avenue alignment is primarily a surface alignment that runs along Wayne Avenue. However, several tunnels and one aerial structure are under consideration to connect the Purple Line between the Silver Spring Transit Center and Wayne Avenue and from Wayne Avenue east of Sligo Creek Parkway to Arliss Street, near Piney Branch Road. These alignments are shown in Figure 2-2.

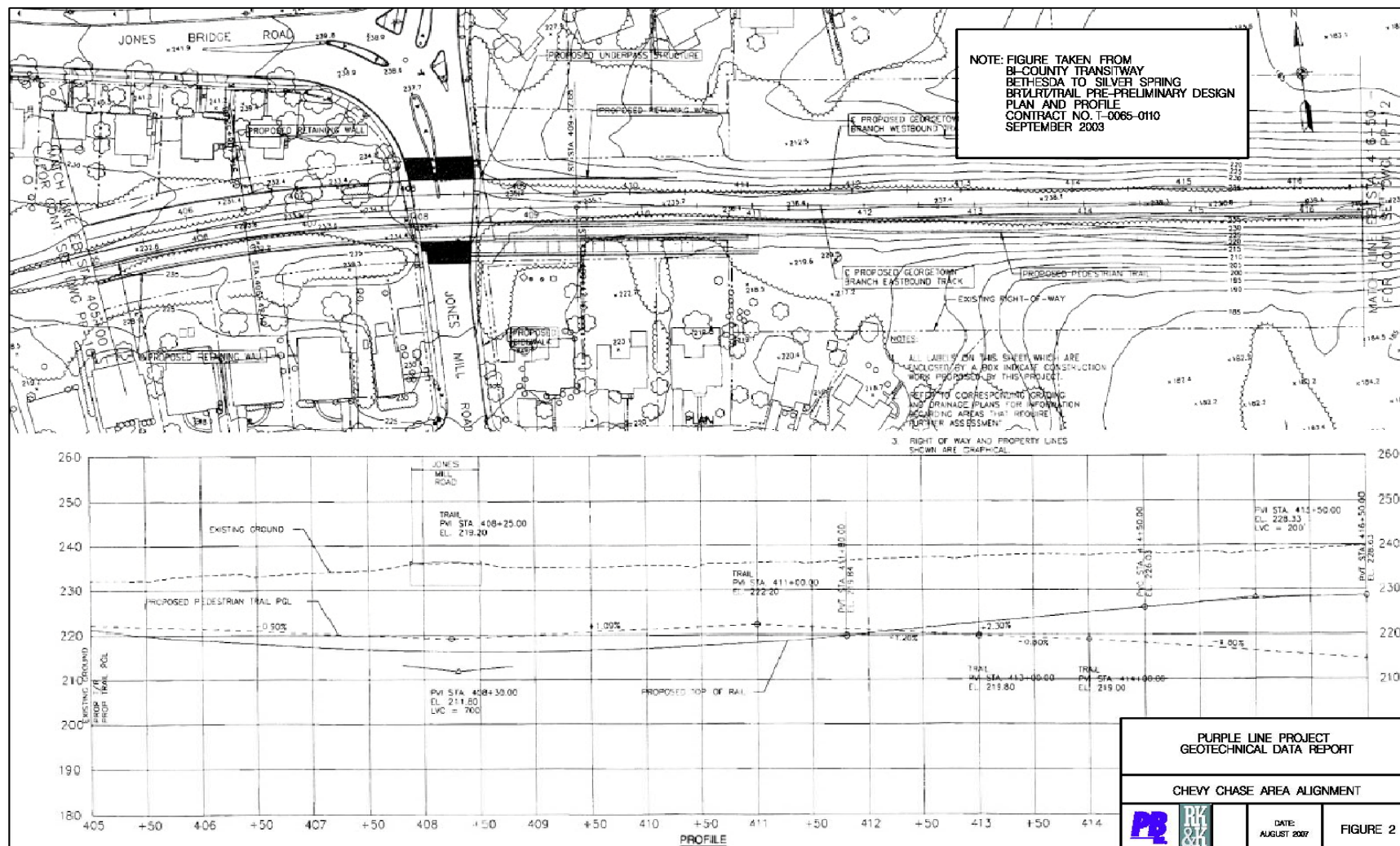
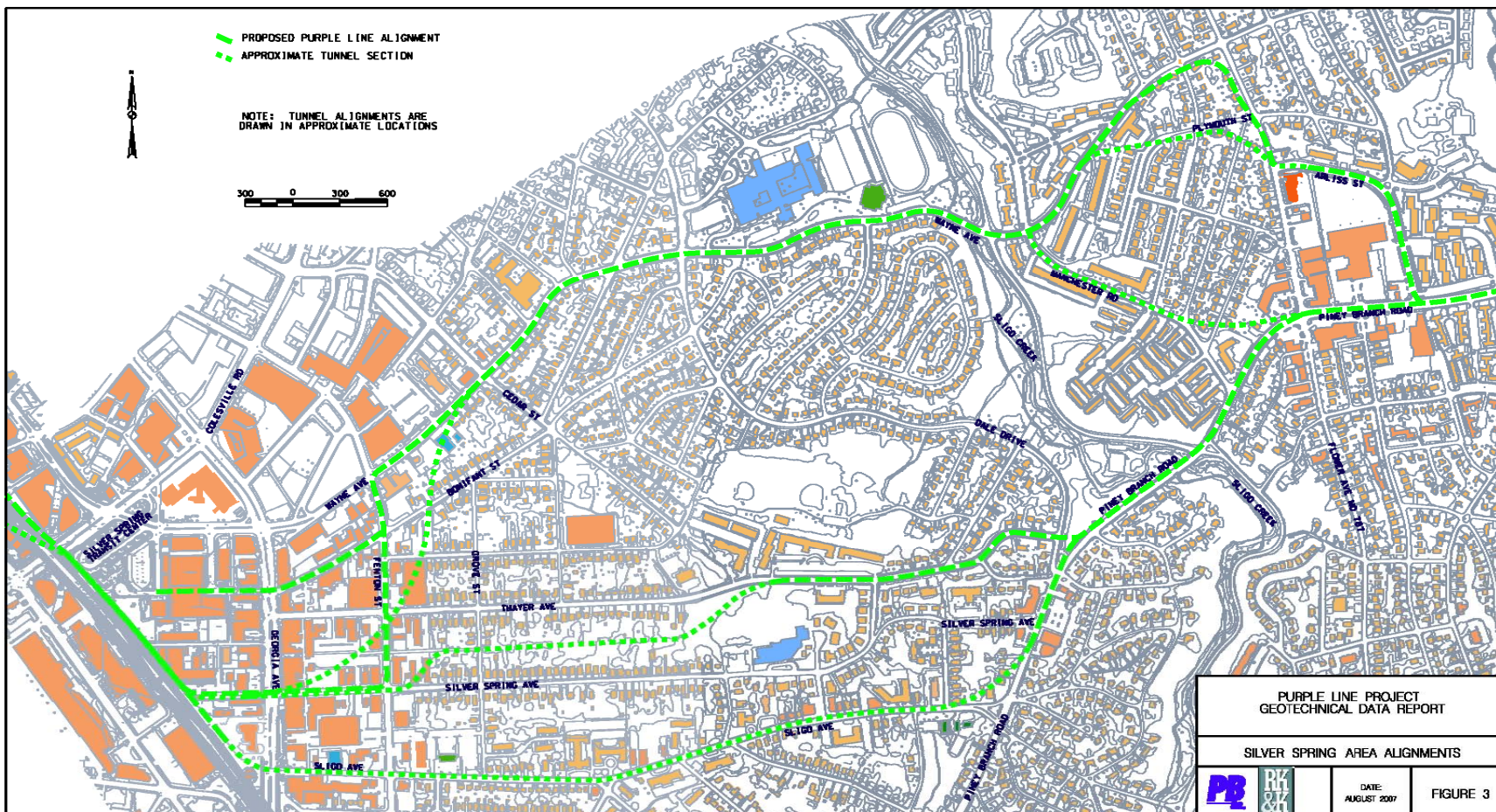


Figure 2-1: Chevy Chase Area Alignment





Two alternatives are under consideration to connect the Silver Spring Transit Center to Wayne Avenue. One is a tunnel section that starts on Silver Spring Avenue and turns north/northeast roughly parallel to Fenton Street before connecting to Wayne Avenue at the intersection of Wayne and Cedar Street. This tunnel is approximately 2600 linear feet. The second alternative connecting the Silver Spring Transit Center and Wayne Avenue is an aerial structure that extends down Bonifant Street to Fenton Street, then north along Fenton to Wayne Avenue.

Three alternatives are under consideration to connect the Wayne Avenue alignment to Piney Branch Road after crossing over Sligo Creek. One is a surface alignment that extends north on Wayne to Flower Avenue, then south along Flower Avenue and along Arliss Street before connecting to Piney Branch Road. Two tunnel alternatives are also under consideration. One alignment enters a tunnel from Wayne Avenue east underneath Plymouth Street, emerging from the tunnel on Arliss Street, and then runs at grade to Piney Branch Road. This tunnel is approximately 1400 linear feet. The second tunnel alignment extends east from Wayne Avenue underneath Manchester Road and emerges on Piney Branch Road in the vicinity of Arliss Street. This tunnel is approximately 3000 linear feet.

College Park Underground Alternatives

In College Park, the proposed surface and tunnel alternatives follow the same alignment, as indicated in Figure 2-3. Along this alignment, three tunnel alternatives were investigated. The first tunnel alternative is a relatively shallow cut-and-cover alternative that starts along Union Drive east of President's Drive and extends east past Regents Drive, returning to the surface before US 1. The approximate length of this tunnel is 3800 feet with depths to invert along ranging from approximately 25 to 60 feet below the existing grades. A second tunnel alternative investigated consists of a bored tunnel alternative along this same alignment but with approximate depths to invert in the range of 30 to 85 feet below the existing grades. While the field investigation was underway, a third tunnel alignment consisting of a deep bored tunnel with approximate depth to invert of 125 feet in the area of Campus Drive was considered. The limits of this deeper tunnel were not well defined at the time of the investigation, but the depths of this tunnel were investigated in the area of the other two tunnel alternatives. Two underground stations were considered, one near the Cole Student Activities Building and one near the Stamp Student Union on Campus Drive.

Riverdale Park Underground Alternative

In Riverdale Park, one tunnel alignment was investigated. For this alignment, the tunnel section begins near the north entrance to Anacostia River Park on Haig Drive, extends directly south underneath the park before turning east under the Northeast Branch, and emerges within the median of East West Highway where it runs parallel to the road as a surface alignment. This tunnel alignment is presented in Figure 2-4. The approximate tunnel length for this alignment is 3800 linear feet.

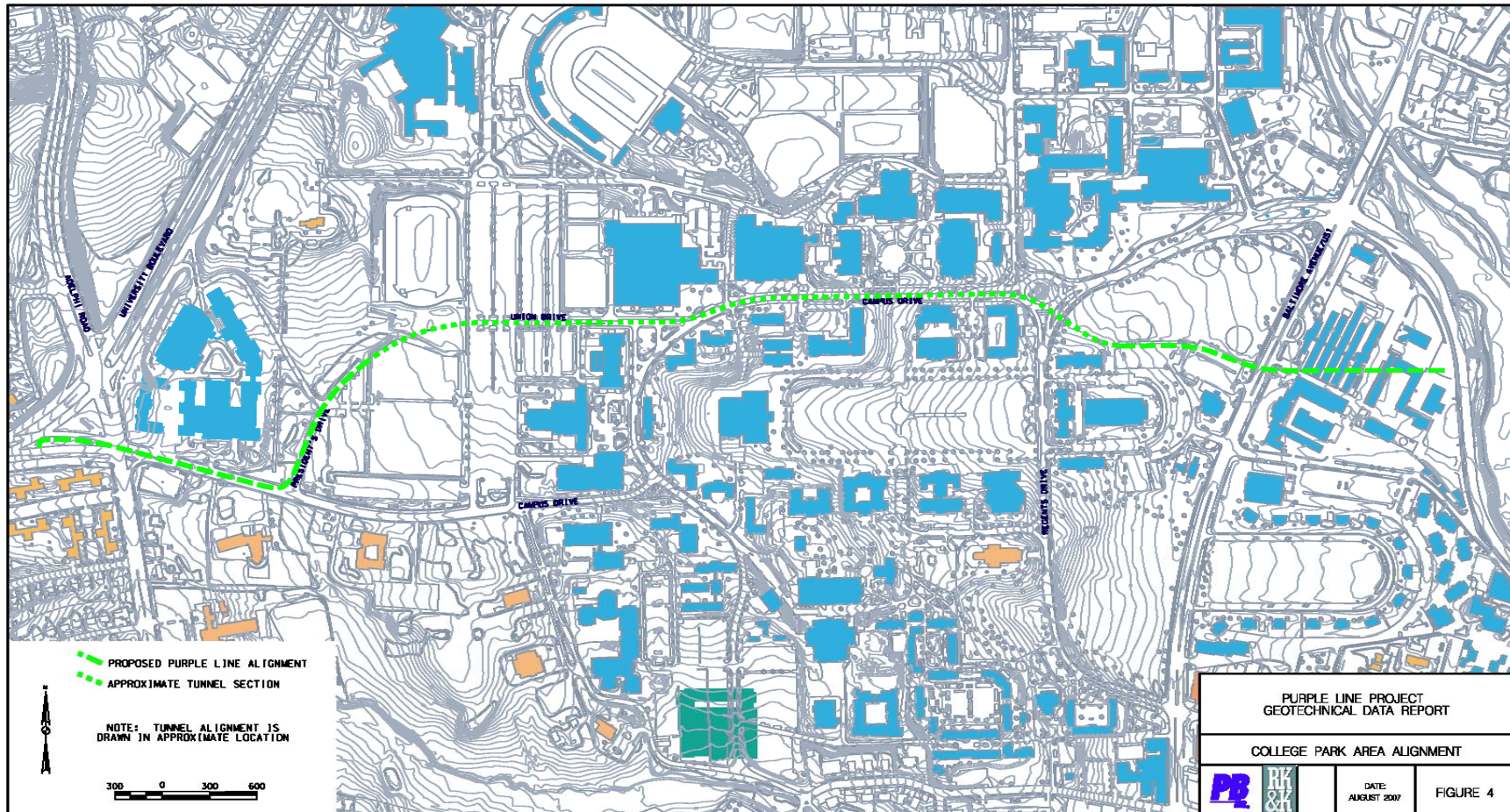


Figure 2-3: College Park Area Alignment

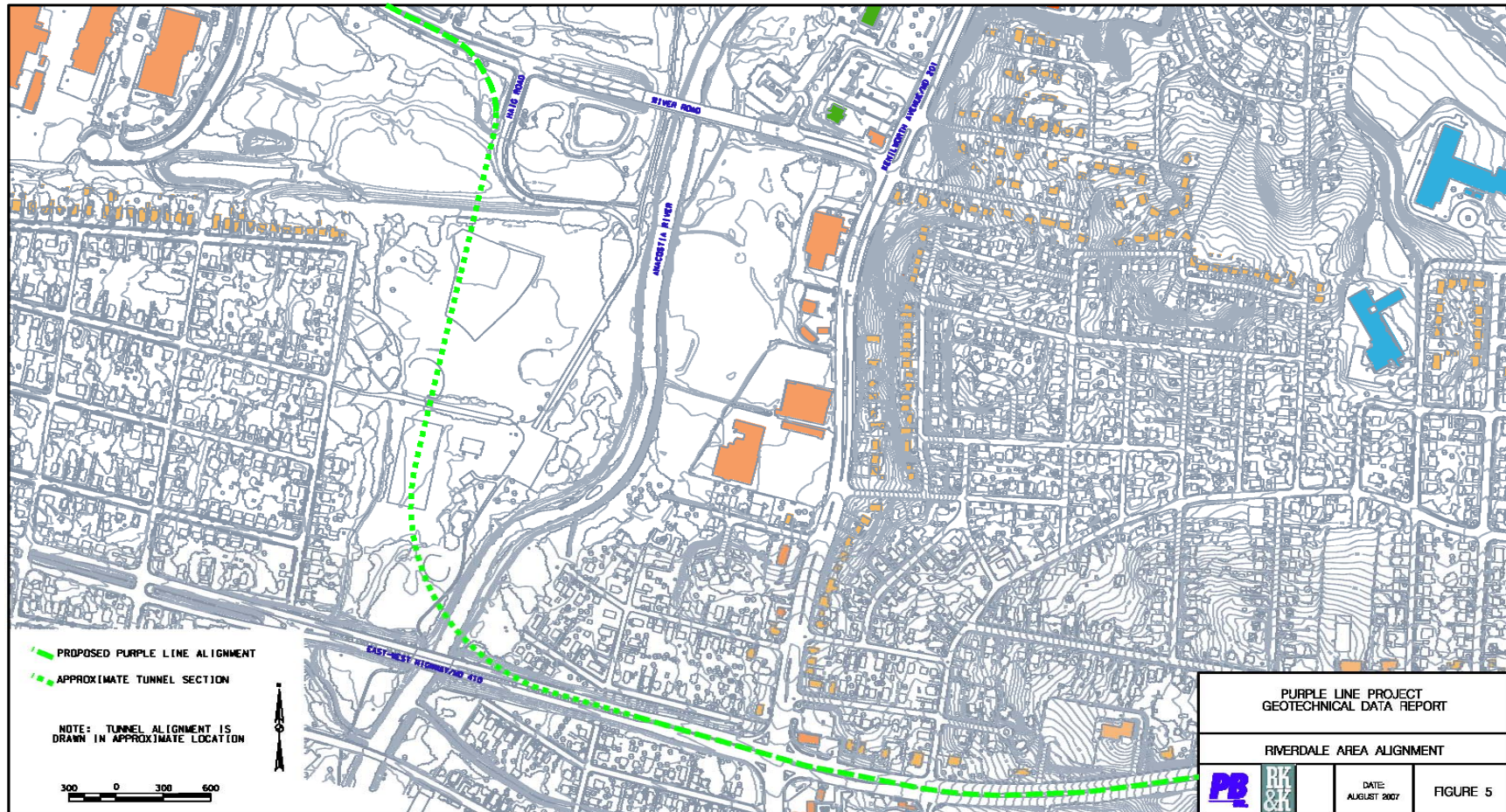


Figure 2-4: Riverdale Area Alignment

2.1. Investigation Description and Locations

In Chevy Chase, the investigation was conducted at the east and west sides of the crossing of the Georgetown Branch right-of-way and Jones Mill Road. In Silver Spring, the subsurface investigation extended approximately east-west between University Boulevard and the Silver Spring Transit Center and north-south between Wayne Avenue and Sligo Avenue. In College Park, the subsurface investigation extended approximately east-west between Regents Drive and Valley Drive and was confined to Union and Campus Drives. In Riverdale Park, the investigation was conducted east-west between Kenilworth Avenue and Haig Drive and north-south between River Road and East West Highway. The purpose of the study was to identify subsurface conditions along proposed tunnel alignments using existing geologic and historic data, borings through overburden soil and bedrock, laboratory soil and rock testing, and groundwater observation wells. Two borings were performed in Chevy Chase as indicated in Figure 2-5. A total of 24 borings were performed in Silver Spring as shown in Figure 2-6. A total of four boring locations were investigated in College Park as shown in Figure 2-7. A total of four boring locations were investigated in Riverdale Park as indicated in Figure 2-8. The borings were labeled based on the alignments they were used to investigate. Borings for the two alignments connecting the Silver Spring Transit Center to Wayne Avenue were labeled as the Wayne Avenue boring series. Offset borings, drilled to obtain undisturbed samples or to overcome difficult drilling conditions, were labeled with the same boring number and a letter suffix.

2.2. Purpose and Scope of Work

The purpose of this Geotechnical Data Technical Report is to provide background geologic information and information on the procedures used for the subsurface investigation and to present the data collected from the historical sources and from the subsurface investigation. The subsurface investigation consisted of soil borings and sampling, rock coring, groundwater observation wells, and laboratory testing of soil and rock samples.

The scope of this Geotechnical Data Technical Report is limited to the presentation of factual data from the geotechnical investigation performed for the underground alignments in the areas of Chevy Chase, Silver Spring, College Park, and Riverdale Park. Also included for informational purposes is a limited amount of data collected from earlier geotechnical investigations undertaken by others in the vicinity of the project site.

2.3. Review of Historical Records and Data

Efforts were made to collect data related to the scope of work and project area from other sources or investigations in the subject areas. General geologic data regarding bedrock geology, overburden thickness, and overburden composition for Chevy Chase and Silver Spring in Montgomery County was obtained by review of Bedrock Map of Montgomery County, Maryland (Froelich, 1975A), Thickness of Overburden Map of Montgomery County, Maryland (Froelich, 1975B), and Contour Map of Base of Saprolite (Froelich, 1975C). General geologic

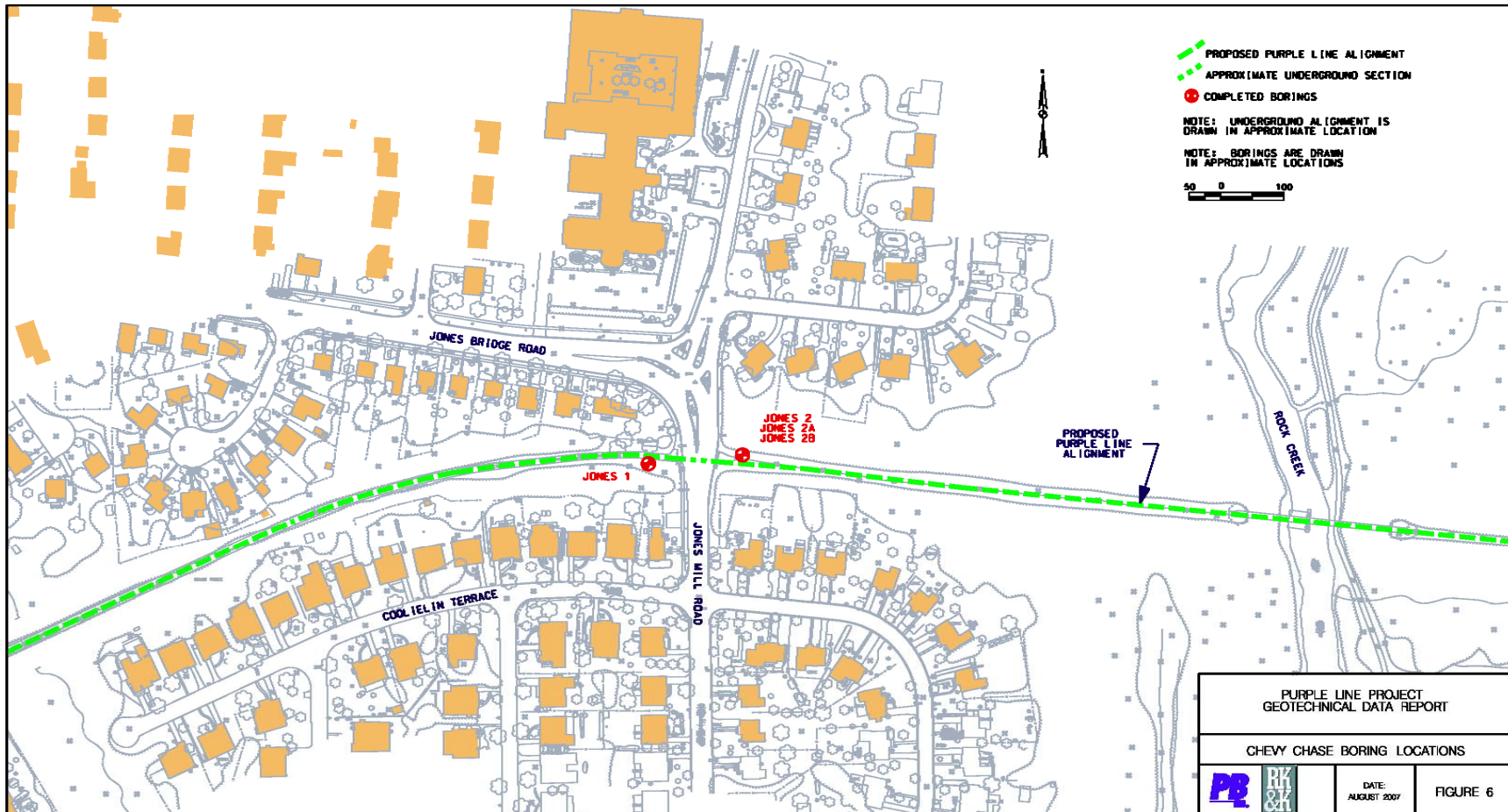


Figure 2-5: Chevy Chase Boring Locations

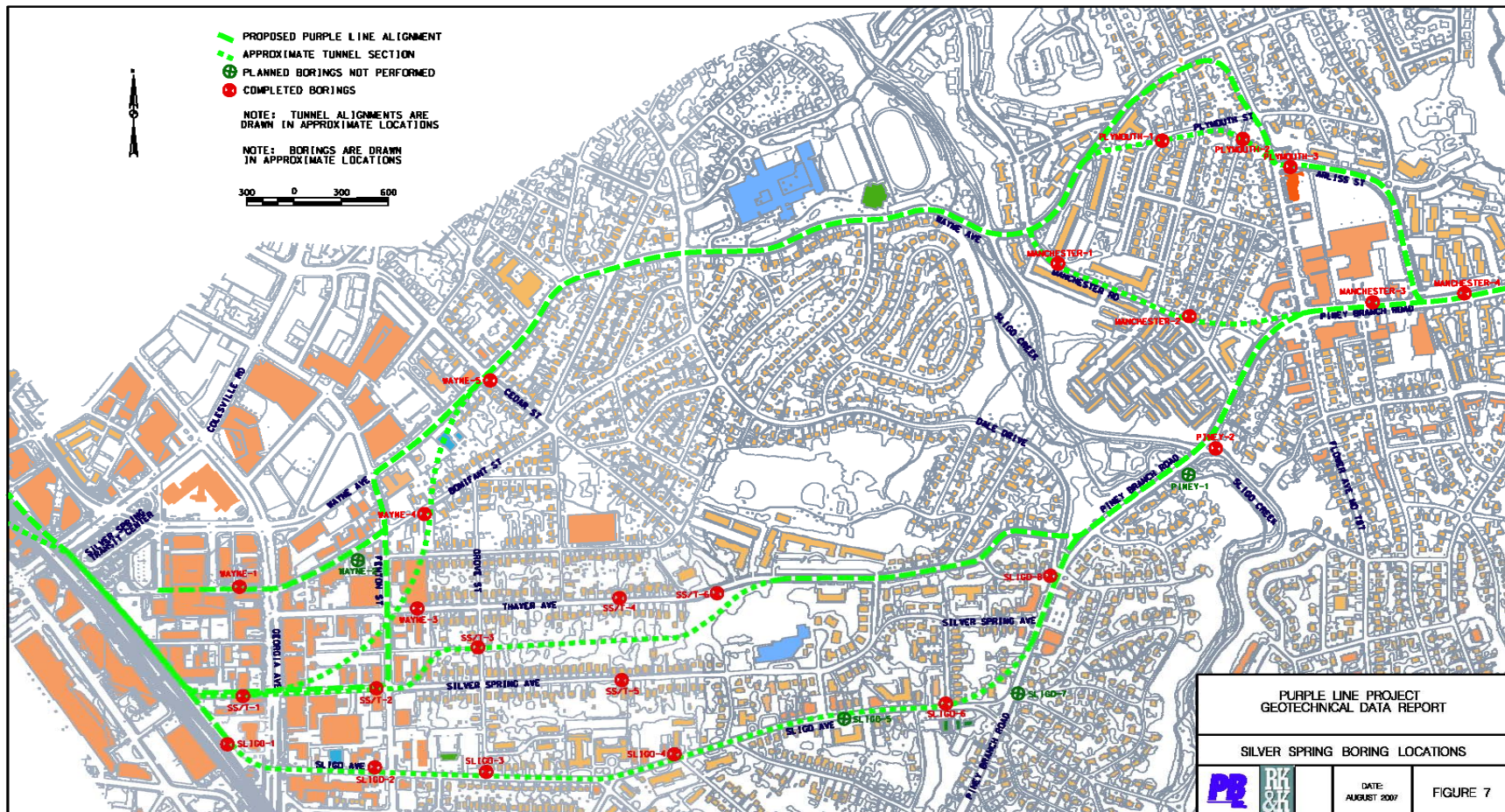


Figure 2-6: Silver Spring Boring Locations

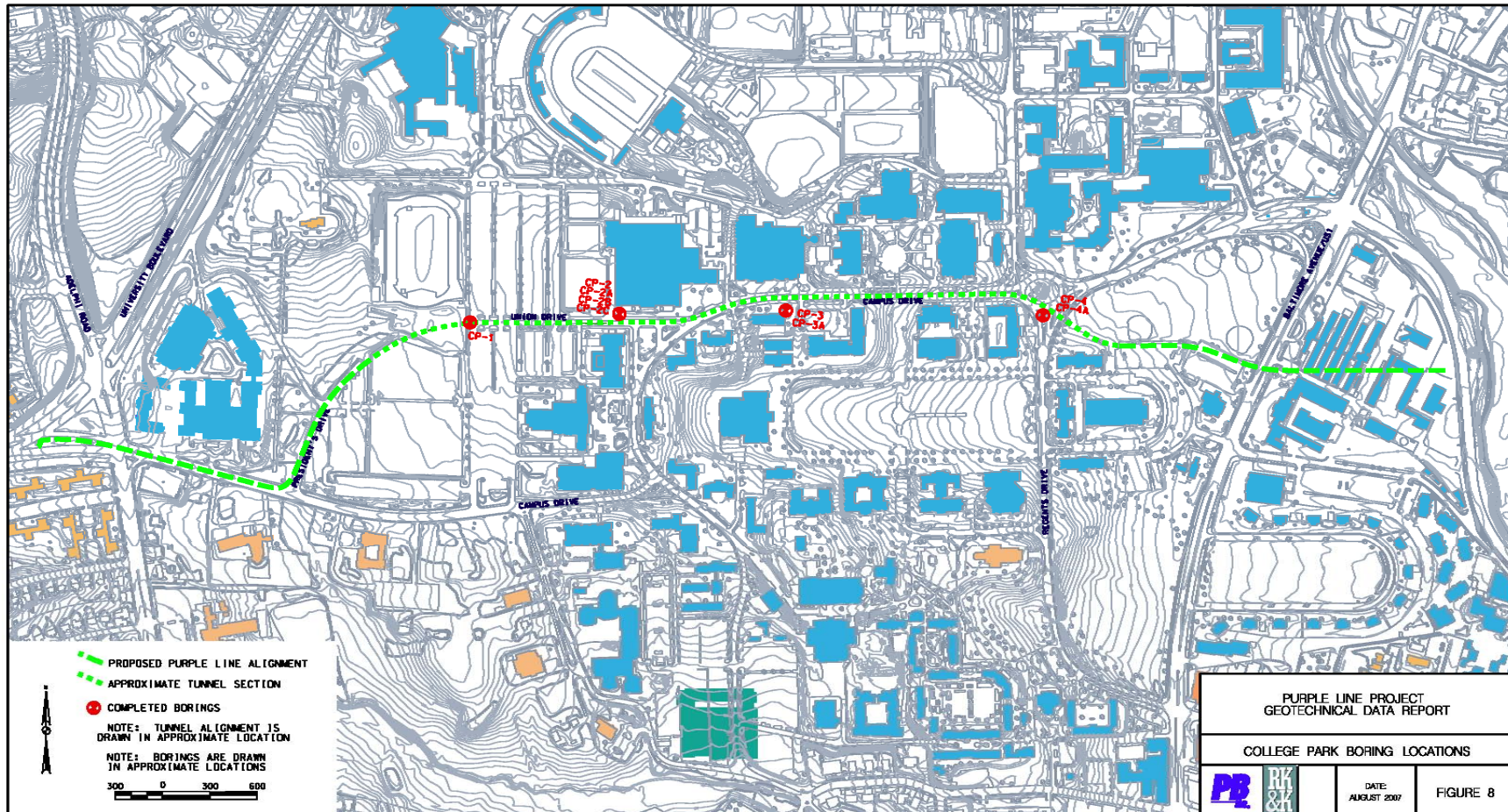


Figure 2-7: College Park Boring Locations

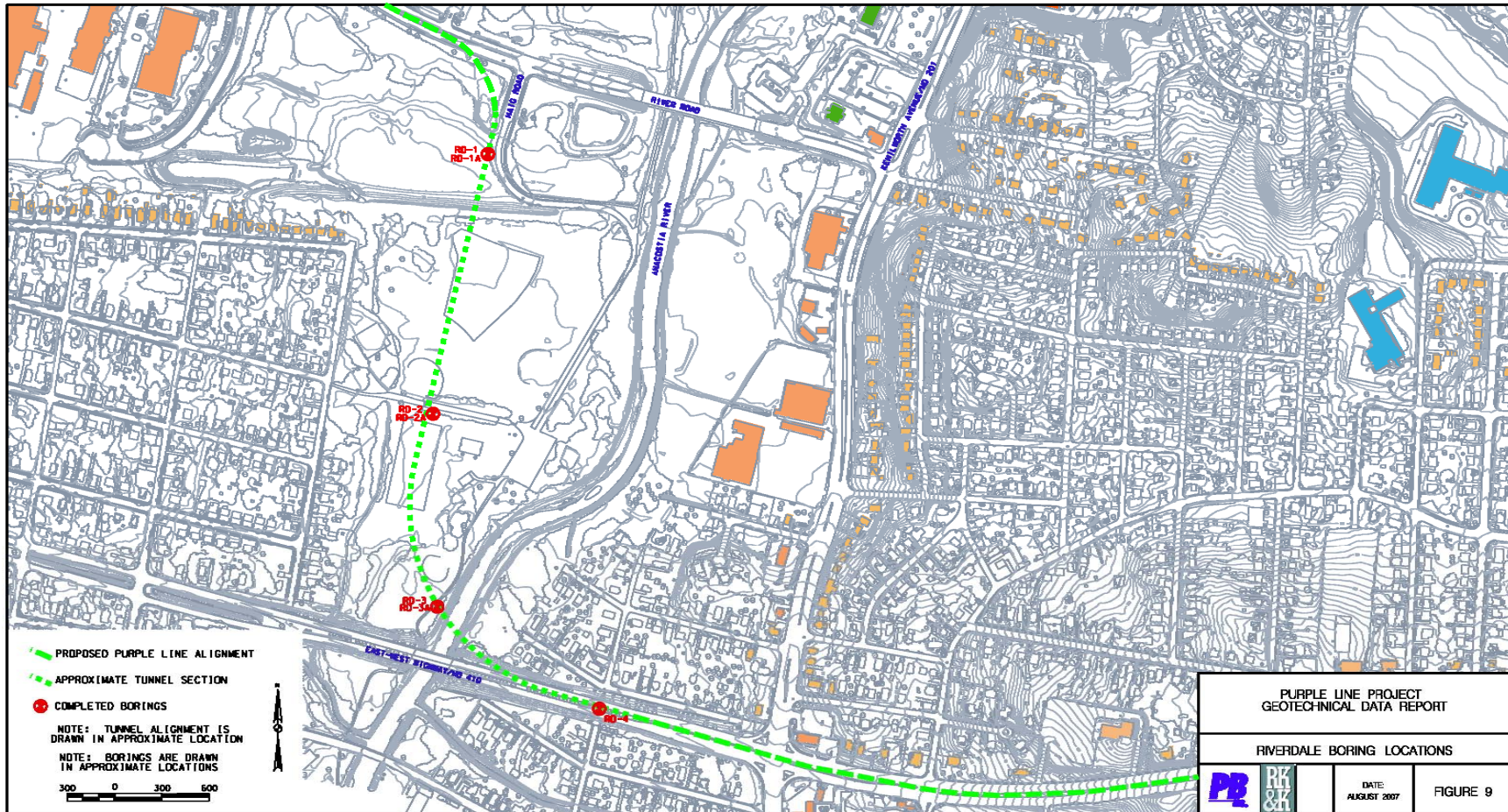


Figure 2-8: Riverdale Boring Locations



data regarding soils and formations regarding College Park and Riverdale Park areas in Prince Georges County were obtained from Geologic Map of Southern Maryland (MGS, 1968) and Coastal Plain Geology of Southern Maryland (Glaser, 1968).

Site specific investigations in the vicinity of the proposed tunnels were obtained from available previous investigations. These investigations included previous borings for this project as well as borings for other projects and adjacent or near to the proposed alignments.

In Chevy Chase, the Purple Line alignment crosses underneath Jones Mill Road along the alignment of the Georgetown Branch of the B&O Railroad. The Georgetown Branch was originally constructed beginning in the 1890s and discontinued service in 1985. The railroad property was transferred to government agencies in 1987 and converted into a temporary hiker/biker trail that opened in the 1990s (R. Christopher Goodwin & Associates, 2000). East of Jones Mill Road is the foundations of the Rock Creek Trestle that carried the railroad over Rock Creek. The trestle was originally a wood trestle built in 1892. In 1904, the section of the trestle over Rock Creek was partially rebuilt, and the section extending from Rock Creek west to Jones Mill Road was filled in with ballast stone and other fill materials (R. Christopher Goodwin & Associates, 2000 and Parsons Brinckerhoff, 2002). The bridge was replaced in 2003.

Soil and rock borings and laboratory testing were previously performed for an earlier phase of this project, the Georgetown Branch Trolley/Trail Project, by Bechtel Corporation (1990). For that report, two borings and associated laboratory testing were performed at the Jones Mill Road crossing. Copies of the boring plan, boring logs, and laboratory test results for the borings at this location are included in Appendix A.

In Silver Spring, geotechnical subsurface data was obtained from two reports by Hillis Carnes Engineering Associates, Inc. (HCEA) for a site located between Thayer and Silver Spring Avenues west of Fenton Street. The investigations at this site were for a proposed parking facility. The first report, from 2000, included 10 borings that were advanced to auger refusal. The second report, a supplementary evaluation performed in 2005, included an additional five borings, with one boring penetrating into bedrock. Although performed for a different type of structure, the borings were taken within the project vicinity and provide additional information regarding the general overburden conditions in this area of the project. The data from the 2005 HCEA report, including the project location plan, boring plan, copies of the original and supplementary borings, and lab testing data are included in Appendix B.

In College Park, subsurface investigations were conducted throughout the University of Maryland campus, primarily for foundation design of the various campus buildings. Records of available foundation borings for buildings along the Union Drive and Campus Drive corridors were obtained from the University of Maryland archives. These borings tend to be relatively shallow, generally terminating above the tunnel profile, but provide useful information regarding the near surface conditions and foundation soils for the adjacent structures. Copies of the boring plans and logs are included in Appendix C.



In Riverdale Park, a tunnel alternative passes under Anacostia River Park and emerges along East West Highway. Several borings were performed around one of the ball fields within the park for the Maryland National Capital Park and Planning Commission (M-NCPPC) in 2007. Historic borings were also available from State Highway Administration records for East West Highway in this area, including borings for the bridge over the Northeast Branch. Copies of the boring plans and logs for the M-NCPPC borings and copies of the relevant drawing sheets for the State Highway Administration borings are included in Appendix D.

2.4. Horizontal Control And Elevation Datum

For horizontal control, the North American Datum of 1983, 1991 adjustment (NAD 83/91) using the Maryland State Plane Coordinate System was used for the Purple Line project datum. For vertical control, the North American Vertical Datum of 1988 (NAVD88) was used for the Purple Line project datum.

3. Site Conditions and Site Geology

3.1. Site Conditions

The proposed Purple Line underground alignments generally run through residential, park, and commercial properties. Commercial properties are generally low to medium height commercial or academic buildings. Residential properties generally consist of single family homes, except for some apartment buildings and townhomes in Silver Spring.

3.1.1. Chevy Chase Alignment

The proposed alignment in Chevy Chase runs along the Georgetown Branch right-of-way and underneath Jones Mill Road. The Interim Capital Crescent trail is a gravel trail constructed along the alignment of the old Georgetown Branch of the B&O freight railroad, including an old trestle that was filled in on the east side of Jones Mill Road. The proposed underground crossing will cross under Jones Mill Road. Adjacent to the trail and the alignment on the north and south sides are single family homes on individual lots as shown in Figure 2-5

3.1.2. Silver Spring Alignments

The proposed alignments in Silver Spring traverse both residential and commercial property in urban and suburban areas. The site is characterized by at-grade rail lines extending from the Silver Spring Transit Station at the westernmost end; urban development generally consisting of low to medium height commercial buildings and roadways on the west side of the study area; suburban residential, park development, and roadways in the center of the study area; and suburban commercial and residential development and roadways at the easternmost end across Sligo Creek. Site surface conditions are indicated in Figure 2-6.

3.1.3. Sligo Avenue Alignment

The Sligo Avenue tunnel alignment begins west of the intersection of Georgia Avenue and Sligo Avenue, behind Silver Spring Fire Station No. 1; continues east under Sligo Avenue, then north along Piney Branch Road transitioning to an aerial structure over Sligo Creek. The tunnel is mostly underneath the Sligo Avenue and Piney Branch Road roadways, with the turn from Sligo north under Piney Branch passing under a few residential houses. Structures adjacent to the roadway along the alignment include the fire station, small commercial buildings, residential homes, apartment buildings, and a police station.

3.1.4. Silver Spring/Thayer Avenue Alignment

The Silver Spring/Thayer Avenue alignment begins west of the intersection of Silver Spring Avenue and Georgia Avenue, extends east in tunnel under Silver Spring Avenue and between Silver Spring and Thayer Avenues, emerges from the tunnel with a portal to Thayer Avenue west of East Silver Spring Elementary School, and extends east along Thayer Avenue to Piney Branch Road. The tunnel alignment runs underneath roadways bordered by light commercial buildings until east of Fenton Street, then extends underneath commercial buildings and an alley until crossing Grove Street. East of Grove Street the tunnel runs underneath the back yards of the



residential properties of Silver Spring and Thayer Avenues, finally emerging from a portal within a steep hill at the rear of the property of East Silver Spring Elementary School.

3.1.5. Wayne Avenue Alignment

The Wayne alignment begins in light commercial areas and extends east to Wayne Avenue. The aerial structure along Bonifant Street and Fenton Street is bordered by light commercial properties and a few residences along Bonifant Street east of Georgia. The tunnel from Silver Spring Avenue to Cedar Street runs underneath roadways bordered by light commercial buildings until Georgia Avenue, then runs underneath commercial properties until east of Fenton Street, then underneath residential houses and near a church with a school until reaching the intersection of Cedar Street and Wayne Avenue.

3.1.6. Manchester Road Alignment

From Wayne Avenue, the tunnel alignment under Manchester Road runs underneath the roadway until the intersection of Manchester and Reading Road, then runs east under several residential houses until reaching Piney Branch Road, then runs under the roadway to a portal on Piney Branch Road. Structures adjacent to the roadway along Manchester Road include apartment buildings, town homes, and residential houses. Structures adjacent to the roadway section under Piney Branch include light commercial properties.

3.1.7. Plymouth Street Alignment

From Wayne Street, the Plymouth tunnel alignment extends east under residential housing property and apartment complex properties, underneath Plymouth Street and residential houses, and emerges from a portal on Arliss Street with light commercial and residential housing adjacent to the street.

3.1.8. College Park Alignment

The proposed tunnel alternatives in College Park all follow the same alignment. This alignment runs through the University of Maryland campus. The site is characterized by two lane roadways, surface parking lots, and academic buildings with shallow foundations or one-level basements. The College Park alignment is shown in Figure 2-7.

In College Park, all of the alternatives follow the same alignment. At the time of this investigation, there are three tunnel alternatives that are under consideration. These include one deep, bored tunnel with invert as low as 125' below ground extending from the west end of the University of Maryland campus and emerging east of Baltimore Avenue/US 1, although at the time of the investigation the exact locations of the portals were not clear. The other tunnels alternatives, which consist of a shallower bored tunnel and a one cut-and-cover tunnel, follow the same alignment and start and end within the campus. These shallower tunnel alignments travel under Union Drive to where it intersects Campus Drive, then under Campus Drive to where it intersects Regents Drive. The portals for the long tunnel are at the west end of Union Drive and east of Baltimore Avenue/US Route 1. The portals for these two tunnel alternatives are at the west end of Union Drive and the southeast intersection of Campus Drive and Regents Drive. A map of the College Park alignment is shown in Figure 2-7.

3.1.9. Riverdale Park Alignment

The proposed tunnel alignment in Riverdale Park runs under the athletic fields of Anacostia River Park and the Northeast Branch and returns to grade along East West Highway in a residential corridor. There are no major structures in the area of the tunnel through the park. As the tunnel passes under the Northeast Branch, it will be within approximately 170 feet of the bridge carrying East West Highway over the river. The section along East West Highway is bordered by residential single family homes, although the tunnel itself will be within the median of the roadway, which is 3 lanes in each direction and on an embankment for the length of the tunnel alignment. The Riverdale Park tunnel alignment is shown in Figure 2-8.

3.2. Site Geology

3.2.1. Chevy Chase and Silver Spring

The Chevy Chase and Silver Spring areas are within the Piedmont Physiographic Province. The areas are underlain by crystalline metamorphic bedrock, with foliation generally striking primarily north-northeast and dip steeply to the northwest or southeast (Froelich 1975A). Most of the metamorphic rocks in Montgomery County are foliated with platy minerals, such as mica and chlorite, and split most readily along the orientation of the foliations. Joints are common and generally oriented perpendicular to the foliation (Froelich 1975A). Overburden consists primarily of decomposed rock or saprolite, which can vary in thickness from zero to 160 feet (Froelich 1975B). The top of bedrock generally follows the contour of the ground surface (Froelich 1975C). The Chevy Chase project area is underlain by schist bedrock and the Silver Spring project area is underlain by gneiss bedrock as illustrated in Figure 3-1.

Overburden

Geologic maps indicate that the gneiss and schist formations in Montgomery County are generally overlain by micaceous saprolite and residual soil. The overburden overlying gneiss generally ranges from zero to 100 feet in thickness with an average of 40 feet, and the overburden overlying schist generally ranges from zero to 160 feet in thickness with an average of 60 feet (Froelich 1975A). Overburden in the Chevy Chase and Silver Spring project areas typically includes a thin amount of fill materials, sometimes similar in composition to the natural residual materials. In general, the overburden is thinner at lower elevations near the stream channels (Froelich 1975B).

Overburden encountered in the borings for the Chevy Chase area ranges from 36 to 45 feet in thickness. In the Silver Spring project area, the borings for this investigation encountered overburden ranging in thickness from 8 feet to 55 feet.

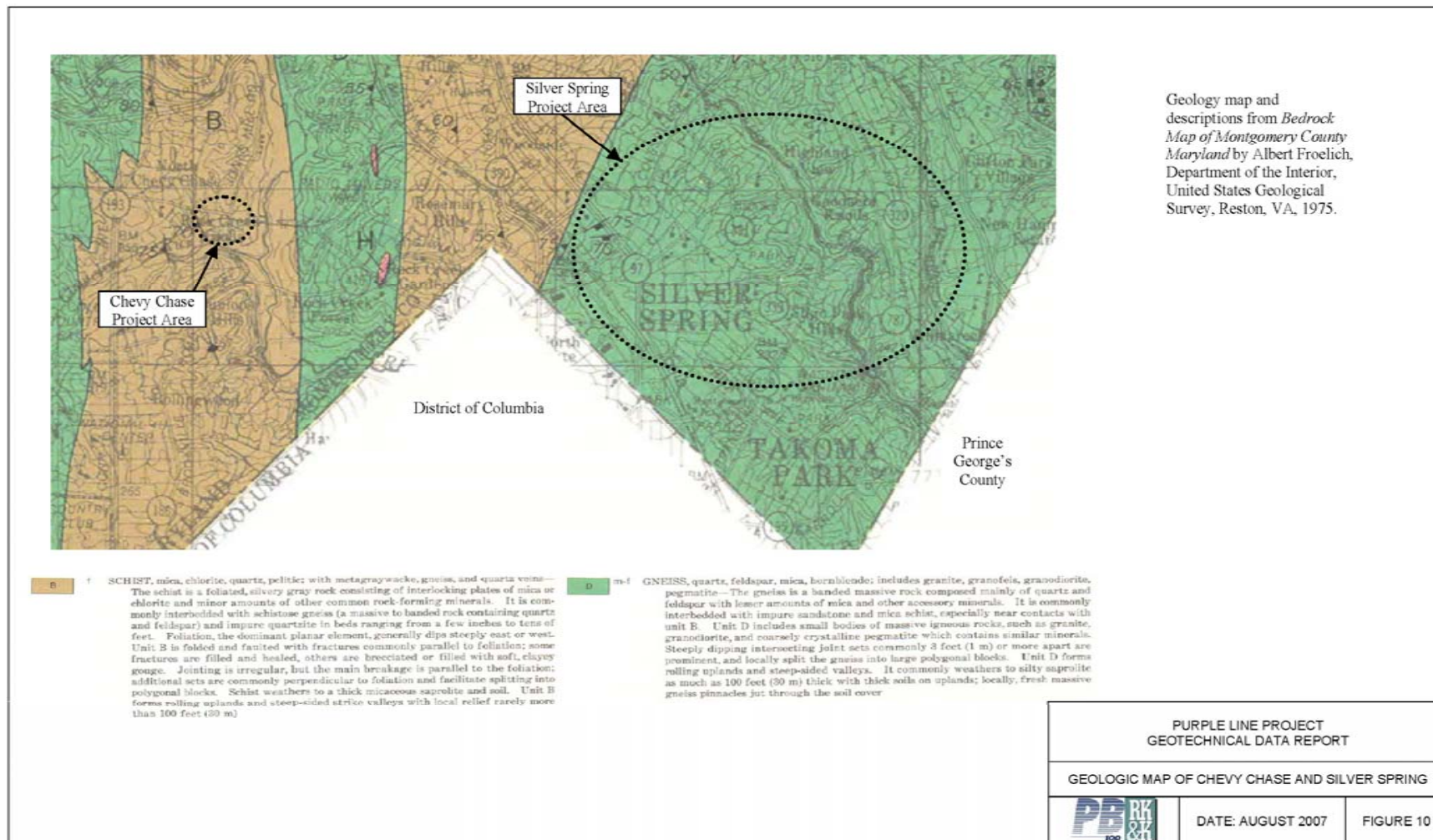


Figure 3-1: Geologic Map of Chevy Chase and Silver Spring

Bedrock Geology

In the Chevy Chase area, the dominant bedrock type is schist composed primarily of mica and chlorite with minor amounts of quartz, feldspar, or other minerals. Foliation generally dips steeply east or west with fractures primarily parallel to foliation, with additional joint sets perpendicular to foliation (Froelich 1975A).

The dominant bedrock type in the Silver Spring area of the project is the Boulder Gneiss of the Wissahickon Formation of Precambrian age. It is a thick bedded to massive, banded metamorphic rock consisting mainly of quartz and feldspar with minor amounts of mica, garnet, and other minerals. Locally it is an intensely foliated gneiss or schistose gneiss. Structural features generally parallel the northeast trend of the Fall Line (Froelich 1975A).

3.2.2. College Park and Riverdale Park

The College Park and Riverdale Park areas are located east of the Fall Zone in the Southern Maryland Coastal Plain. The bedrock surface drops off significantly at the Fall Zone, which is the boundary between the Piedmont Physiographic Province and the Coastal Plain. As a result, bedrock is generally several hundred feet deep and not anticipated within the depths of interest of these project areas. None of the borings performed in these project areas encountered bedrock.

In general, geologic formations in these project areas consist of deposits of alluvial deposits of sand, silt, clay, and gravel. Bedding strikes generally northeast-southwest and dips eastward to southeastward generally less than one degree. The predominant geologic unit in these areas is the Potomac Group formation of the Cretaceous age, which consists of interbedded gravels, sands, and silts and clays. The proportions of each component may vary widely both laterally and vertically over short distances (Glaser, 1968).

In Southern Maryland, the Potomac Group is subdivided into the Patapsco and Raritan Formations, the Arundel Clay, and the Patuxent Formation. The Patapsco and Raritan Formations generally consist of interbedded silty clay and sands and gravels. The sands and gravels are typically gray to yellow in color, and the silt and clays are typically mottled in red, yellow, gray, and purple, with white and gray clays also present. Underlying the Patapsco and Raritan Formations is the Arundel Clay, which consists of a dark gray and maroon hard lignitic clay. The Patuxent Formation, which underlies the Arundel clay, generally consists of gray to brown quartz sands and gravels interbedded with silts and clays. Soils overlying the Potomac Group in these project areas generally consist of relatively thin Late Tertiary to Quaternary deposits consisting predominantly of sand and gravel, with Pleistocene River Terrace deposits along the rivers and streams consisting predominantly of sand, silt, and gravel (Glaser, 1968 and MGS, 1968). Man-made fill deposits are also present and vary widely in composition. The geology of the College Park and Riverdale Park areas is shown in Figure 3-2.

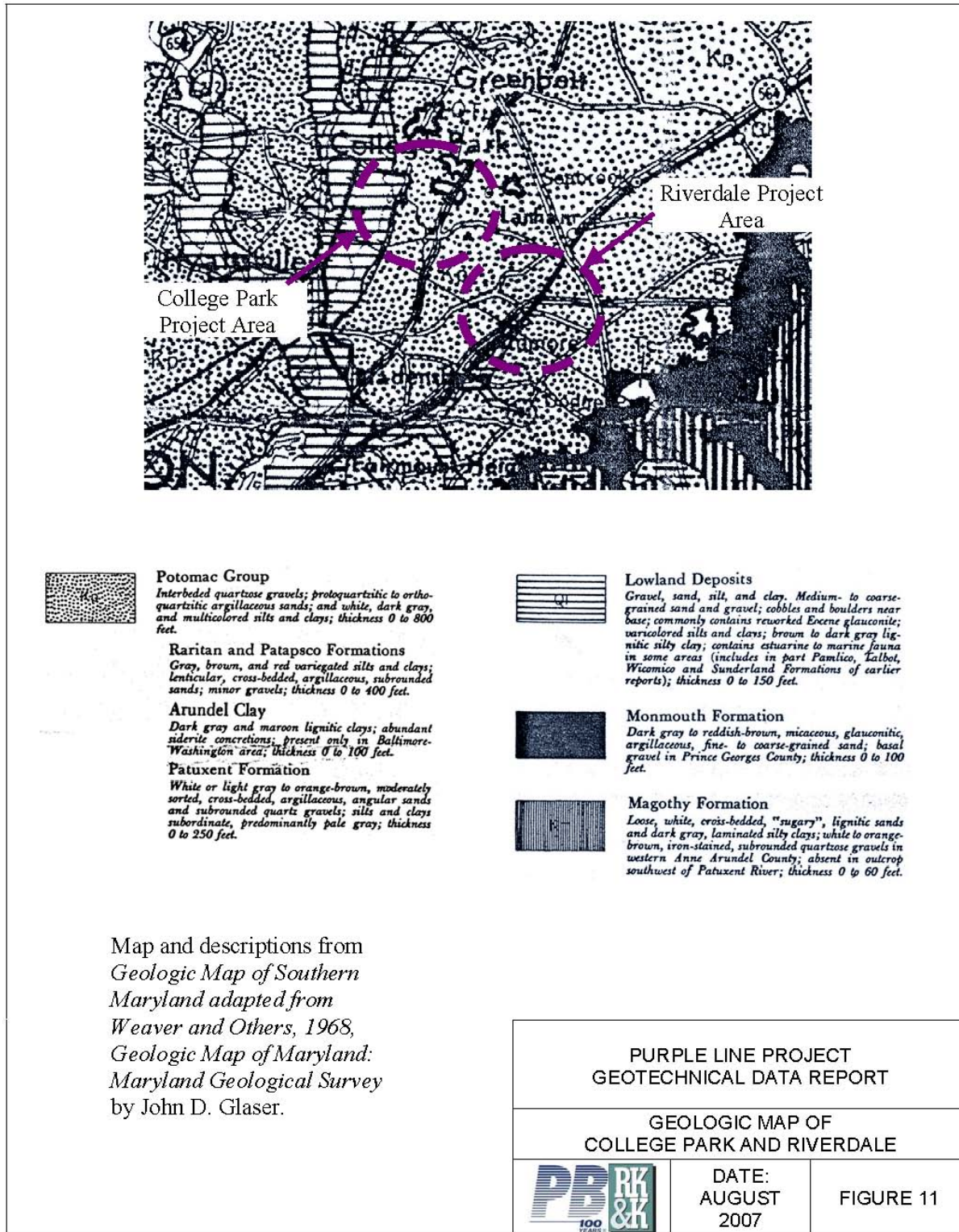


Figure 3-2: Geologic Map of College Park and Riverdale

3.3. Subsurface Investigation

3.3.1. Field Investigation

A total of 44 borings were completed for the subsurface investigations in Chevy Chase, Silver Spring, College Park, and Riverdale Park. Four borings, including offset holes needed to overcome obstruction, were performed in Chevy Chase between May 16, 2007 and May 24, 2007. Twenty-four borings were performed in Silver Spring between January 29, 2007 and April 20, 2007. Four additional borings were planned in Silver Spring but not performed. Those borings were eliminated during the program based on the judgment that sufficient data for the scope of this study had been collected for those alignments and to save budget for explorations in other areas of the project. Nine borings, including offset holes for undisturbed sampling, were performed in College Park between June 14, 2007 and July 27, 2007. Seven borings, including offset holes for undisturbed sampling, were performed in Riverdale Park between August 1, 2007 and August 24, 2007. ~~~~~

A summary of the borings is presented in Table 3-1. The borings are labeled based on project area or, in the case of Chevy Chase and Silver Spring borings, on street names where the proposed alignments run or connect to. The boring locations for Chevy Chase are shown in Figure 2-5. The boring locations for Silver Spring are shown in Figure 2-6. The boring locations for College Park are shown in Figure 2-7. The boring locations for Riverdale Park are shown in Figure 2-8.

Access to Borehole Locations

All borings for Chevy Chase, Silver Spring, College Park, and Riverdale Park were located within public right-of-way. Permits were obtained through the state or respective County for operations within streets. Access to borings located on roadways was generally permitted between 9:00 AM and 3:30 PM. Operations on other county properties, such as the fire station and police station along the Sligo Avenue alignment, were coordinated with the county agencies having jurisdiction over those particular properties. Access for one boring in Silver Spring and for three borings in Riverdale Park required additional permits from M-NCPPC.

Public Relations Program

The Purple Line traverses some densely populated areas and would impact residential and commercial areas. As such, there is significant interest in the project from local citizens and communities. During preliminary walkthroughs of the project area, several citizens attempted to question the personnel in the field with regard to project specifics. In order to maintain a clear point of contact for citizen inquiries and in order to make sure that the field crews did not give out erroneous or misleading information, an information flier was developed. The flier provided brief information regarding the nature of the field investigations and a point of contact for inquiries regarding the project. During the field operations, any inquiring citizens were given a copy of the information flier and asked to direct their inquiries to the contact indicated on the flier. Field personnel notified their supervisors of any fliers distributed and the location of the



Table 3-1: Summary of Borings

Boring Number	Location/Alignment Description	Easting Coordinate	Northing Coordinate	Ground Elevation (ft)	Total Depth (ft)	Remarks
Chevy Chase						
Jones 1	Underground crossing of Jones Mill Road	1293477	484844	258.9	80	
Jones 2	Underground crossing of Jones Mill Road	1293658	484867	260.7	50.5	
Jones 2A	Underground crossing of Jones Mill Road	1293663	484868	260.7	50.5	
Jones 2B	Underground crossing of Jones Mill Road	1293668	484869	260.7	81	Monitoring well
Silver Spring						
Manchester 1	Tunnel from Wayne Ave to Piney Branch Road along Manchester Road	1309745	485259	243.7	90	
Manchester 2	Tunnel from Wayne Ave to Piney Branch Road along Manchester Road	1310581	484923	263.4	90	Monitoring well
Manchester 3	Tunnel from Wayne Ave to Piney Branch Road along Manchester Road	1311776	485021	282.8	100	
Manchester 4	Tunnel from Wayne Ave to Piney Branch Road along Manchester Road	1312367	485087	256.7	90	
Piney 1	Aerial Structure over Sligo Creek along Piney Branch Road	Not performed - deleted from program				
Piney 2	Aerial Structure over Sligo Creek along Piney Branch Road	1310751	484078	204.5	49.7	
Plymouth 1	Tunnel from Wayne Ave to Piney Branch Rd along Plymouth Road and Ariss Street	1310372	486020	306.1	100	
Plymouth 2	Tunnel from Wayne Ave to Piney Branch Rd along Plymouth Road and Ariss Street	1310920	486047	317.1	100	Monitoring well
Plymouth 3	Tunnel from Wayne Ave to Piney Branch Rd along Plymouth Road and Ariss Street	1311287	485877	308.2	90	
Sligo 1	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	1304482	482207	335.9	90	Monitoring well
Sligo 2	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	1305357	482035	350.4	89.6	
Sligo 3	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	1306030	482036	348.1	90	
Sligo 4	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	1307179	482083	329.3	89.5	Monitoring well
Sligo 5	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	Not performed - deleted from program				
Sligo 6	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	1309068	482429	307.0	89.5	
Sligo 7	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	Not performed - deleted from program				
Sligo 8	Tunnel from SSTC to Piney Branch Road along Sligo Avenue	1309689	483270	244.9	89.7	Monitoring well
SS/T 1	Tunnel from SSTC to Piney Branch Rd along Silver Spring/Thayer Avenues	1304591	482514	340.1	90	
SS/T 2	Tunnel from SSTC to Piney Branch Rd along Silver Spring/Thayer Avenues	1305369	482540	328.8	89.8	Monitoring well
SS/T 3	Tunnel from SSTC to Piney Branch Rd along Silver Spring/Thayer Avenues	1306099	482803	309.1	99.5	
SS/T 4	Tunnel from SSTC to Piney Branch Rd along Silver Spring/Thayer Avenues	1306911	483112	310.0	100.0	Monitoring well
SS/T 5	Tunnel from SSTC to Piney Branch Rd along Silver Spring/Thayer Avenues	1306844	482604	300.5	90.5	Monitoring well
SS/T 6	Tunnel from SSTC to Piney Branch Rd along Silver Spring/Thayer Avenues	1307630	483184	270.4	90	
Wayne 1	Aerial Structure from SSTC to Wayne Avenue along Bonifant Street	1304554	483196	353.4	54.6	
Wayne 2	Aerial Structure from SSTC to Wayne Avenue along Bonifant Street	Not performed - deleted from program				
Wayne 3	Tunnel from Silver Spring Avenue north to Wayne Avenue	1305659	483072	328.4	99.8	
Wayne 4	Tunnel from Silver Spring Avenue north to Wayne Avenue	1305726	483665	333.6	99.8	Monitoring well
Wayne 5	Tunnel from Silver Spring Avenue north to Wayne Avenue	1306154	484499	323.9	90	

Notes: SSTC = Silver Spring Transit Center, 8404 Colesville Road, Silver Spring, MD 20910

Table 3-1: Summary of Borings (continued)

Boring Number	Location/Alignment Description	Easting Coordinate	Northing Coordinate	Ground Elevation (ft)	Total Depth (ft)	Remarks
College Park						
CP-1	Tunnel portal at west end of Union Drive	1326627	480924	158.3	59	
CP-2	Tunnel on Union Drive in front of the Cole Student Activities Building	1327345	480972	174.3	102	
CP-2A	Tunnel on Union Drive in front of the Cole Student Activities Building	1327349	480966	175.1	79	Monitoring well
CP-2B	Tunnel on Union Drive in front of the Cole Student Activities Building	1327342	480967	175	100	
CP-2C	Tunnel on Union Drive in front of the Cole Student Activities Building	1327338	480969	175.1	140	
CP-3	Tunnel on Campus Drive in front of the Health Center	1328213	481096	160.9	140	
CP-3A	Tunnel on Campus Drive in front of the Health Center	1328214	481088	161.3	103	
CP-4	Tunnel at median on Regents Drive at Campus Drive	1329343	480951	97.1	70	
CP-4A	Tunnel at median on Regents Drive at Campus Drive	1329345	480946	96.7	44	Monitoring well
Riverdale						
RD-1	Tunnel portal west of Haig Road and South of River Road	1333930	473678	32.2	70	
RD-1A	Tunnel portal west of Haig Road and South of River Road	1333931	473669	32.2	24	
RD-2	Tunnel south of ballfield four in Riverdale Park	1333644	472654	26.5	90	
RD-2A	Tunnel south of ballfield four in Riverdale Park	1333641	472653	26.7	68	Monitoring well
RD-3	West of Northeast Branch Anacostia River at East-West Highway	13333719	471836	26.1	90	
RD-3A	West of Northeast Branch Anacostia River at East-West Highway	1333716	471826	26.2	55	
RD-4	Tunnel portal in median of East-West Highway east of Northeast Branch Anacostia River	1334287	471421	38.9	70	Monitoring well

Notes: SSTC = Silver Spring Transit Center, 8404 Colesville Road, Silver Spring, MD 20910



work underway at the time so that team management would be aware of possible inquiries. The flier was revised during the course of the field work program when the project name was changed from the Bi-County Transitway to the Purple Line. Copies of the information fliers are presented in Figures 3-3 and 3-4.

Drilling And Sampling

All borings were performed with truck mounted drill rigs. All borings in Chevy Chase, College Park, and Riverdale Park and borings SS/T-3 and SS/T-5 in Silver Spring were drilled using a truck-mounted Diedrich D50 drill rig with manual safety hammer. All remaining borings in Silver Spring were drilled using a truck-mounted CME 55 drill rig with an automatic hammer.

In Chevy Chase and Silver Spring, boreholes were advanced through overburden soils using hollow stem augers with 6.5-inch outside diameter and 3.25-inch inside diameters. For most borings in College Park and Riverdale Park, a combination of hollow stem auger and mud rotary wash techniques with revert were used. Holes were advanced using hollow stem augers unless or until the soil became too dense or stiff, at which time the augers remained in place as casing while mud rotary methods were used to continue the hole. If undisturbed sampling was required, then once the depths of the undisturbed samples were determined, an offset hole was drilled using casing and mud rotary drilling to stabilize and advance the holes. The undisturbed soils generally had to be taken with a pitcher barrel sampler due to the stiffness of the site soils, so casing was used for offset holes instead of augers since the pitcher sampler will not fit within the augers. When mud rotary drilling was performed, organic polymers were used in the drilling fluid.

Soil samples were obtained through the use of Standard Penetration Testing (SPT) in accordance with ASTM D-1586 and relatively undisturbed sampling in accordance with ASTM D-1587. SPT sampling consists of driving a 2-inch diameter split spoon sampler 18 to 24 inches by a 140-pound hammer falling 30 inches; the number of blows required to drive each 6-inch interval is recorded on the boring log. The SPT N-value, which is an indication of soil density or stiffness, is the sum of blows over the last two 6-inch increments for an 18-inch sample or the sum over the middle two increments of penetration for a 24-inch sample. The SPT sampler was generally driven 24 inches during continuous sampling and at least 18 inches during non-continuous sampling intervals. For the residual soils in Chevy Chase and Silver Spring, split spoon refusal was recognized when 50 hammer blows did not advance the sampler six inches. In these areas, refusal may be an indication of bedrock or rock fragments and additional driving may damage the sampler. For the alluvial soils in College Park and Riverdale Park, the refusal criteria was revised to 100 blows per six inch interval. In these areas, the soils are stiff and frequently contain layers or lenses of differing materials, so the criteria was revised to allow the sampler to be driven further to obtain adequate sample size and recovery. Damage to the sampler based on refusal on bedrock or rock fragments in College Park and Riverdale Park was not a concern due to the differing geology.

Soil, Rock and Water Samples Needed as Study Efforts Continue on the Bi-County Transitway Project

This informational flier produced by the Maryland Transit Administration.

The Bi-County Transitway is a proposed east-west transitway between Bethesda, Silver Spring, College Park, and New Carrollton in Montgomery and Prince George's counties. As the Maryland Transit Administration (MTA) continues study efforts on the Bi-County Transitway (Purple Line) project, team members may be collecting soil, rock and water samples from your area in an effort to better understand underground conditions. No borings will be conducted on private property.



Analyses are being done throughout the study area and along multiple corridors under consideration. The information collected will be evaluated and used to assess the feasibility and costs of various alignments. Information will also be used to prepare environmental and economic analyses that will be part of the Draft Environmental Impact Statement (DEIS), a federally required document that examines a proposed project's impacts.

Equipment similar to what is pictured here will be used to create a boring (hole drilled into the ground) to test subsurface soil, rock layers and groundwater. To reach the depths required and to penetrate hard soil or rock, borings are created using motorized equipment. All activities related to this operation will be carefully planned and performed in accordance with required permits, including limited work hours if required. All work associated with these investigations will be performed on weekdays and in public rights-of-way. These types of investigations are often performed during planning phases of projects and do not represent a start of construction or a preference for an alignment.

MTA appreciates your patience as we work to better understand the environmental and geologic conditions of the study area. Please keep all children and animals away from the equipment, especially after dark, as the equipment will be left on or near the site during the testing period.



If you have questions or to learn more about the project, please contact us at:

Bi-County
transitway

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Maryland Transit Administration

6 St. Paul Street

Baltimore, MD 21201

Telephone: 410-767-3694

Email: mmadden@mtamaryland.com

Website: www.bi-countytransitway.com



PURPLE LINE PROJECT
GEOTECHNICAL DATA REPORT

ORIGINAL INFORMATION FLIER



DATE:
AUGUST
2007

FIGURE 12

Figure 3-3: Original Information Flier



Soil, Rock and Water Samples Needed as Study Efforts Continue on the Purple Line Project

This informational flier produced by the Maryland Transit Administration.

The Purple Line is a proposed east-west transitway between Bethesda, Silver Spring, College Park, and New Carrollton in Montgomery and Prince George's counties. As the Maryland Transit Administration (MTA) continues study efforts on the Purple Line project, team members may be collecting soil, rock and water samples from your area in an effort to better understand underground conditions. No borings will be conducted on private property.



Analyses are being done throughout the study area and along multiple corridors under consideration. The information collected will be evaluated and used to assess the feasibility and costs of various alignments. Information will also be used to prepare environmental and economic analyses that will be part of the Draft Environmental Impact Statement (DEIS), a federally required document that examines a proposed project's impacts.

Equipment similar to what is pictured here will be used to create a boring (hole drilled into the ground) to test subsurface soil, rock layers and groundwater. To reach the depths required and to penetrate hard soil or rock, borings are created using motorized equipment. All activities related to this operation will be carefully planned and performed in accordance with required permits, including limited work hours if required. All work associated with these investigations will be performed on weekdays and in public rights-of-way. These types of investigations are often performed during planning phases of projects and do not represent a start of construction or a preference for an alignment.

better understand the environmental and geologic conditions of the study area. Please keep all children and animals away from the equipment, especially after dark, as the equipment will be left on or near the site during the testing period.



MTA appreciates your patience as we work to

If you have questions or to learn more about the project, please contact us at:



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Email: mmadden@mtamaryland.com
Website: www.purplelinemd.com



PURPLE LINE PROJECT
GEOTECHNICAL DATA REPORT

REVISED INFORMATION FLIER



DATE:
AUGUST
2007

FIGURE 13

Figure 3-4: Revised Information Flier

In Chevy Chase and Silver Spring, SPT Samples were generally collected continuously in the top ten feet from ground surface and at five foot intervals thereafter until auger refusal was encountered. Upon auger refusal, the borings were advanced by diamond bit rock coring. In a few borings that were within traffic areas, rock coring was commenced at near auger refusal. In these holes, when sampler refusal was obtained and it appeared that auger refusal was near, the augers were advanced to be flush with the pavement surface. Advancing to full auger refusal might have resulted in the upper auger flight sticking up in the roadway after the work shift was over and thereby causing a traffic obstruction, so instead the augers were advanced to the pavement surface to prevent stickup, and rock coring was commenced. In College Park and Riverdale Park, SPT samples were collected continuously in the range from one tunnel diameters above the crown of the shallowest proposed tunnel to one tunnel diameter below the invert of the deepest proposed tunnel invert. Outside of the continuous sampling depths, SPT samples were taken at five foot intervals.

Relatively undisturbed samples of fine-grained soils were obtained using a pitcher barrel sampler in accordance with ASTM D-1586. The tube sampling procedure requires advancing the barrel at a slow, steady rate for 36 inches. The spring-loaded tube with 3.0-inch outside diameter and 2.87-inch inside diameter either leads or trails the outer, rotating core barrel, depending on the hardness of the material being penetrated. The sampler remains still in the hole for a minimum of fifteen minutes after it is advanced 36 inches. Rotating the sampler shears the bottom edge of the sample, which is then removed from the hole.

Rock coring was performed in accordance with ASTM D2113 using an NX-sized double-tube core barrel with impregnated diamond bit and wireline apparatus. The NX core barrel is approximately 3 inches outside diameter and recovers a core sample approximately 2 inches in diameter. Rock core runs were generally five feet long.

A representative sample from each SPT sample was tightly sealed in a glass jar with screw top lid. Undisturbed samples were sealed inside their tubes while on site. Each end was coated with a wax seal no less than one-half inch thick. The annular space between the wax and the end of the tube was filled with a non-compressible material such as sand and covered with a fitted plastic lid. Recovered rock core was stored in wooden core boxes with secured covers. Recovered soil and rock samples were taken back to E2CR's laboratory for testing.

Upon completion, borings in Chevy Chase were backfilled with cuttings except where a groundwater observation well was installed. All borings in Silver Spring, except where groundwater observation wells were installed, were cement tremie grouted to or above the top of bedrock. The remainder of each boring within the soil overburden was sealed with bentonite. All borings in College Park and Riverdale Park, except where groundwater observation wells were installed, were cement tremie grouted to the ground surface. The ground surfaces were restored as appropriate with grass seed and straw in landscaped areas and asphalt patch or concrete in paved areas.



Borehole Logging Procedures

Full time oversight of the drilling and sampling operations included describing and classifying all recovered soil and rock samples on a field boring log. Field oversight and borehole logging was performed under the supervision of a professional engineer and a professional geologist

Soil Sample Logging

Soil sample materials were described according using criteria, definitions, and descriptive terms of the Burmister Soil Classification System. In addition, soils were classified according to the Unified Soil Classification System (USCS). Summaries of the Burmister Soil Classification System and the USCS are provided in Appendix E. Other pertinent information related to boring location, sample depth, blow counts, sample type and observations during the drilling operation were also noted on the boring logs. The final boring logs are presented in Appendix F for Chevy Chase, Appendix K for Silver Spring, Appendix P for College Park, and Appendix S for Riverdale Park.

Rock Core Logging and Photography

All rock cores were classified and coring logs prepared in the field while the rock was fresh and unaffected by handling. The rock was logged in conformance with the recommendations and terminology presented in Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses by the International Society for Rock Mechanics (ISRM) (1977). A summary of the rock classification terms is presented in Appendix E.

For each core run, the depth of the run, the recovery, and the Rock Quality Designation (RQD) were recorded on the core box and on the log. The RQD value is an indication of the quality and degree of fracturing of the rock and defined as the sum of the length of rock core pieces greater than 4-inches divided by the total core run length. Also included on the log is a description of the rock lithology, structure, weathering, continuity, strength, color, grain size, and character of discontinuities and joint spacing, including orientation, roughness, alteration and infilling materials. The orientation angle of fracture surfaces were measured relative to the axis of the recovered core sample, with the axis of the core considered to be 90 degrees (i.e. vertical) and 0 degrees considered parallel to a horizontal horizon. All fracture orientation angles are measured between zero and 90 degrees. In addition, drilling parameters such as the type of drilling equipment, type of core barrel, casing size, drilling rate and down pressure, and changes in water return were recorded.

In order to provide a visual record of the recovered rock samples, each core box was photographed in the laboratory after all runs were logged. Core photographs are presented in Appendix G for the Chevy Chase borings and Appendix L for the Silver Spring borings.

Groundwater Observations

Groundwater levels were generally measured in the borings during and/or following completion of drilling operations. In addition, groundwater observation wells were installed in selected borings along each tunnel alignment alternative in order to monitor groundwater levels over

time. The as-drilled locations of the observations wells coincide with the boring locations shown on the boring location plans.

The observation wells in Silver Spring and Chevy Chase consist of a 0.75-inch inside diameter PVC pipe. This size of pipe was needed due to the smaller diameter of the drill hole in bedrock. In College Park and Riverdale Park, where no rock was encountered, observation wells consist of approximately 2-inch inside diameter PVC pipe. For all observation wells, the well screen consists of a 10-foot section of 0.010-inch machine-slotted PVC pipe that is connected with a threaded flush joint to a solid-wall PVC riser pipe, which extends to ground surface. The bottom end of the well screen was capped to prevent soil from entering into the PVC. At the ground surface, a steel well cap was installed and cement grouted in place to prevent the entrance of foreign materials or surface water into the well casing or riser pipe. In pavement areas, wells were capped with flush mount steel caps. In grass areas, a steel well casing extending approximately two-and-a-half feet above the ground surface was installed.

Construction logs for all observation wells are presented in Appendix H for Chevy Chase, and Appendix M for Silver Spring, Appendix Q for College Park, and Appendix T for Riverdale Park. The well screens were placed near the bottom of the boreholes. The annular spaces between the well screen and the borehole bottom and walls were backfilled with uniform, No. 2 silica sand to approximately 2 feet above the screen to act as a filter between the adjacent soil or rock and the well screen. The remaining depth of the borehole was sealed with bentonite and/or cement grout.

During the drilling operations in College Park, a monitoring well was installed at boring CP-2B. After installation of this well was completed, it was determined that additional information at deeper depths should be collected for some of the on-going evaluations of a deeper alternative. In drilling an offset hole at CP-2C to investigate the deeper depths, fluid was repeatedly lost into the well at CP-2B. Therefore, the well at CP-2B was closed using Portland cement and bentonite. Problems with hole stability prevented re-building of the well in the additional offset hole. A copy of the well closure record is included in Appendix Q.

Periodic groundwater readings were taken following completion of the well installations. A summary of observation well readings is listed in Table 3-2. Records of the readings are included in the appendices noted above.

3.3.2. Laboratory Testing Program

Soil Testing

The results of the laboratory soil testing are summarized in Table 3-3. The laboratory soil test data is presented in Appendix I for Chevy Chase, Appendix N for Silver Spring, Appendix R for College Park, and Appendix U for Riverdale Park.



Table 3-2: Summary of Groundwater Observation Reading

Date	Groundwater Elevation (ft)													
	Chevy Chase	Silver Spring									College Park		Riverdale	
	Jones 2B	Manchester 2	Plymouth 2	Sligo 1	Sligo 4	Sligo 8	SS/T 2	SS/T 4	SS/T 5	Wayne 4	CP-2A	CP-4	RD-2A	RD-4
2/20/2007				309.8										
2/28/2007				309.9	306.8				291.5					
3/5/2007				310.0					290.0					
3/6/2007								282.9						
3/12/2007				310.1				295.4	287.9					
4/2/2007			294.5											
4/2/2007		250.0		310.4			320.3	296.9	285.0					
4/9/2007		250.0	297.1	310.2			322.2	295.9	285.8					
4/18/2007		250.4	297.3	310.1	314.2		320.3	296.7	285.3					
4/25/2007		250.6	297.5	310.5	314.1	225.6	320.3	297.3	285.2					
4/26/2007		250.6	297.4	310.5	314.3	226.4	321.9	296.4	285.1	316.5				
5/2/2007		250.7	297.5	310.4	314.1	224.2	321.2	296.0	285.0	316.5				
5/7/2007		250.4	297.3	310.3	314.2	223.4	320.1	295.5	285.0	316.4				
5/10/2007		250.6	297.3	310.3	314.1	222.9		295.3	284.9	316.5				
5/21/2007		250.1	297.0	310.2	314.5	221.6	320.2	294.6	284.7	316.1				
6/2/2007		249.7	296.5	310.0	314.5	220.3		293.8	284.5	315.7				
6/6/2007		249.5	296.3	310.0	314.4	220.0	320	293.7	284.3	315.7				
6/14/2007	232.2	249.1	295.8	310.0	314.3	219.2	320.1	293.6	284.5	315.4				
6/27/2007											173.9			
7/10/2007	231.6	248.1	294.2	309.8		217.0	322.3	292.1	283.9	314.6				
7/18/2007	231.4	247.7	293.5	309.6	317.8	216.5	319.6	291.7	283.5	314.3				
7/19/2007											168.3	70.9		
7/20/2007	231.2											70.8		
7/25/2007	230.7													
7/26/2007												70.9		
8/7/2007														25.9
8/9/2007														25.9
8/10/2007												65.3		
8/14/2007														
8/15/2007												70.6		11.9
8/17/2007												70.6		26.2
8/20/2007												70.6	25.1	
8/22/2007	230.1													26.4
8/23/2007												70.6		
8/24/2007													-34	
8/27/2007	228.2											70.6		
9/6/2007												70	-28	26.2
9/14/2007												70	-30.4	25.8
9/24/2007												70.5	-29.5	
9/27/2007												70.3	-28.9	
10/5/2007												70.2	-27.9	
10/12/2007														
10/25/2007													-28.9	25.4
11/1/2007												70.4	-28.8	26
11/8/2007												71.8		26.3
11/15/2007														
11/29/2007														
12/13/2007	227.4	245.5	287.6	310.2		210	328.1	289	282.1	312.3		69.7	-17	25.6
12/19/2007	230.5	245.7	287.5	309.9		210.4	325.9	289.6	282.2	312.3		69.7	-16	26.1

Table 3-3: Summary of Laboratory Testing Results on Soil Samples

Boring Number	Sample Number	Sample Depth (feet)	Test Results					
			Percent Passing		Moisture Content (%)	Liquid Limit	Plastic Limit	USCS Classification
			Sieve #4	Sieve #200				
Chevy Chase								
Jones 1	S-3	4.0-6.0	100.0	43.1	22.2	NP	NP	SM
Jones 1	S-6	13.5-15.0	100.0	30.4	22.2	NP	NP	SM
Jones 1	S-9	28.5-30.0	100.0	35.4	34.6	NP	NP	SM
Jones 2	S-8	23.5-25.0	97.3	24.4	13.8	NP	NP	SM
Jones 2	S-9	6.0-10.0	98.1	28.6	11.5	NP	NP	SM
Silver Spring								
Manchester 1	S-2	2.0-4.0	97.1	34.3	7.9	NP	NP	SM
Manchester 1	S-3&4	4.0-8.0	99.9	34.4	8.3	NP	NP	SM
Manchester 1	S-6&7	13.5-20.0	95.2	29.1	6.7	NP	NP	SM
Manchester 1	S-8,9,10	23.5-35.0	95.4	27.2	6.6	NP	NP	SM
Manchester 2	S-5&6	6.0-10.0	98.4	18.4	9.9	NP	NP	SM
Manchester 4	S-6,7,8	13.5-25.0	99.9	28.8	7.6	NP	NP	SM
Plymouth 1	S-3&4	4.0-8.0	94.2	32.5	14.4	37	33	SM
Plymouth 1	S-7	18.5-20.0	100.0	30.4	11.0	NP	NP	SM
Plymouth 1	S-9&10	28.5-35.0	89.5	20.5	5.7	NP	NP	SM
Plymouth 2	S-6	13.5-15.0	99.7	24.7	10.4	35	30	SM
Plymouth 2	S-9	28.5-30.0	99.8	29.0	12.2	NP	NP	SM
Plymouth 2	S-10	33.5-35.0	89.3	26.2	3.9	NP	NP	SM
Plymouth 3	S-3	5.0-7.0	99.0	45.4	18.0	47	40	SM
Plymouth 3	S-6&7	13.5-20.0	100.0	44.6	21.5	42	37	SM
Plymouth 3	S-9	28.5-30.0	100.0	36.1	16.0	NP	NP	SM
SS/T 1	S-4&5	6.0-10.0	98.5	22.3	11.2	NP	NP	SM
SS/T 1	S-8	23.5-25.0	91.4	27.1	15.6	NP	NP	SM
SS/T 1	S-10	33.5-35.0	97.6	27.5	8.5	NP	NP	SM
SS/T 2	S-5B&6	9.0-15.0	98.9	37.8	15.6	NP	NP	SM
SS/T 2	S-7,8,9	18.5-30.0	99.3	33.6	10.8	NP	NP	SM
SS/T 3	S-5,6,7	13.5-25.0	85.8	21.7	11.1	NP	NP	SM
SS/T 6	S-3&4	4.0-8.0	60.7	18.1	7.9	NP	NP	SM
Wayne 5	S-2&3	2.0-6.0	94.1	24.8	5.1	NP	NP	SM

Notes: USCS = Unified Soils Classification System
NP = Non Plastic



**Table 3-3: Summary of Laboratory Testing Results on Soil Samples
(continued)**

Boring Number	Sample Number	Sample Depth (feet)	Test Results					
			Percent Passing		Moisture Content (%)	Liquid Limit	Plastic Limit	USCS Classification
			Sieve #4	Sieve #200				
College Park								
CP-1	S-4&5	7.0-9.0	79.2	23.1	7.9	20	13	SC-SM
CP-1	S-14&15	27.0-31.0	100.0	33.7	22.8	NP	NP	SM
CP-1	S-17	33.0-35.0	100.0	28	23.1	NP	NP	SM
CP-1	S-25&26	49.0-53.0	100	30.3	19.2	27	19	SC
CP-2	S-5&6	20.0-24.0	100	83.7	23.7	74	25	CH
CP-2	S-12	34.0-36.0	100.0	92.2	16.3	48	20	CL
CP-2	S-14&15	38.0-42.0	99.8	16.5	13.4	22	18	SC-SM
CP-2	S-23	56.0-58.0	100.0	95.6	23.5	65	28	CH
CP-2	S-33	76.0-78.0	100.0	99.2	20.7	63	25	CH
CP-3	S-6	28.0-30.0	100.0	96	24.5	63	27	CH
CP-3	S-17&18	50.0-54.0	100.0	94.3	17.1	37	17	CL
CP-3	S-23	62.0-64.0	100.0	93	23.7	53	24	CH
CP-3	S-26	68.0-70.0	100.0	55.5	19.0	27	15	CL
CP-3	S-31	78.0-80.0	100.0	97.9	20.8	63	25	CH
CP-3	S-40&41	96.0-100.0	100.0	98.7	22.4	59	21	CH
CP-3	S-48&49	112.0-116.0	100.0	88.4	13.4	40	17	CL
CP-3	S-53	122.0-124.0	100.0	56.9	12.5	23	13	CL
CP-4	S-2	8.0-10.0	66.0	26.9	7.7	32	16	SC
CP-4	S-6	16.0-18.0	98.3	69.6	19.7	50	24	CH
CP-4	S-9	22.0-24.0	58.7	8	2.2	NP	NP	SP-SM
CP-4	S-14	32.0-34.0	97.5	8.1	18.5	NP	NP	SP-SM
CP-4	S-18	40.0-42.0	100	97.2	19.4	49	21	CL

Notes: USCS = Unified Soils Classification System
NP = Non Plastic

**Table 3-3: Summary of Laboratory Testing Results on Soil Samples
(continued)**

Boring Number	Sample Number	Sample Depth (feet)	Test Results					
			Percent Passing		Moisture Content (%)	Liquid Limit	Plastic Limit	USCS Classification
			Sieve #4	Sieve #200				
Riverdale								
RD-1	S-4	6.0-8.0	83.6	37.9	14.8	22	16	SC-SM
RD-1	S-9	16.0-18.0	100	26	19.9	19	15	SC-SM
RD-1	S-12	22.0-24.0	100	82.3	16.1	33	16	CL
RD-1	S-15	28.0-30.0	100	95	22.1	57	23	CH
RD-1	S-16	30.0-32.0	100	96.5	22.2	53	22	CH
RD-1	S-19	36.0-38.0	100	51.7	18.0	19	12	CL-ML
RD-1	S-25	48.0-50.0	100	21.2	19.4	NP	NP	SM
RD-2	S-2	4.5-6.5	39.6	9.5	6.3	21	16	GP-GC
RD-2	S-4	14.5-16.5	100	83.8	19.3	31	23	ML
RD-2	S-9	26.0-28.0	100	84.4	15.6	58	20	CH
RD-2	S-12&13	32.0-36.0	100	96.2	18.2	50	18	CH
RD-2	S-20&21	48.0-52.0	100.0	99.3	21.0	55	21	CH
RD-2	S-28&29	64.0-68.0	100	99.1	21.8	63	20	CH
RD-3	S-5	19.5-21.5	100	65.8	19.4	30	17	CL
RD-3	S-7	28.0-30.0	100	95.0	19.9	46	19	CL
RD-3	S-11&12	36.0-40.0	100	94.1	19.0	46	18	CL
RD-3	S-15	44.0-46.0	100.0	98.1	20.3	52	17	CH
RD-3	S-19	52.0-54.0	100.0	68.9	17.1	43	17	CL
RD-3	S-25	64.0-66.0	100.0	44.9	18.6	22	15	SC-SM
RD-4	S-3	4.0-6.0	98.9	63.7	12.0	24	14	CL
RD-4	S-8	14.0-16.0	75.7	21.1	10.8	25	16	SC
RD-4	S-12&13	22.0-26.0	100	51.9	19.6	31	18	CL
RD-4	S-18	34.0-36.0	100	71.1	19.8	41	18	CL
RD-4	S-21	40.0-42.0	100	51.8	25.0	20	20	ML
RD-4	S-23	44.0-46.0	100	94.1	22.1	55	21	CH
RD-4	S-25	51.0-53.0	100	62.6	17.9	32	17	CL

Notes: USCS = Unified Soils Classification System
NP = Non Plastic



Disturbed Soil Sample Testing

Selected soil samples were tested for classification and environmental testing. Select soil samples from all project areas were tested for gradation analysis with hydrometer (ASTM D422), natural moisture content (ASTM D2216), and Atterberg Limits (ASTM D4318).

The results of the laboratory classification testing have been incorporated into the soil description on the boring logs. In addition, select soil samples from College Park and Riverdale Park were tested for pH (ASTM G57-95), Chlorides (AASHTO T-291-4), Sulfates (ASTM C 1580), and Sulfides (SM4500S2).

Undisturbed Soil Sample Testing

In addition to performing classification and index property testing, additional laboratory testing was performed on recovered undisturbed samples from College Park and Riverdale Park. Testing on undisturbed samples included One Dimensional Swell (ASTM D4546), isotropically Consolidated Undrained (CU) triaxial testing with pore pressure measurements (ASTM D4767), and Direct Shear (DS) strength testing (ASTM D3080) and One-Dimensional Consolidation testing (ASTM D 2435).

When performing the Direct Shear tests on the recovered samples from College Park, it was found that the samples swelled when saturated. For each confining pressure, the tests were run two ways: once allowing the sample to swell and reach equilibrium before shearing, and once without allowing the sample to swell. At the time of this study, both conditions were considered potentially applicable since both bored and cut and cover options were being considered, and the College Park area includes a significant number of existing structures, so both methods were performed in order to have adequate data to cover a range of possible conditions that may be encountered. For the Riverdale Park area, there are not many existing buildings within the area of the tunnel, so this area was not considered to be as critical. The Direct Shear tests for Riverdale Park were run without allowing the sample to swell, which is generally the more common procedure in practice. Testing of undisturbed samples was performed at an AASHTO and United States Army Corps of Engineers-accredited laboratory. Results of these tests are in the appendices indicated above.

Rock Testing

The physical properties and strength of bedrock were determined on selected rock core samples. Unconfined uniaxial compression tests of rock cores with stress-strain measurements were conducted according to ASTM D2938.

For the Chevy Chase area, three rock samples were tested at E2CR's in-house laboratory with results ranging from 1,810 psi to 4,400 psi.

For the Silver Spring tunnel alignment alternatives, 58 rock samples were tested at E2CR's in-house laboratory. Results of these tests varied widely from 320 pounds per square inch (psi) to over 20,000 psi. Review of several of these samples by PB/RK&K indicated that failure of some

of the lower strength samples occurred along structural features, although this was not recorded on the lab forms.

As a quality check, an additional 21 rock core samples from Silver Spring were tested at an AASHTO and Corps of Engineers-accredited laboratory. These samples were taken from similar depths in many of the same runs of samples that were tested. These additional test results had a narrower scatter, from 1,460 psi to 16,606 psi, and lab test results included indications that some of the failures were along existing structural features such as joints or foliation planes.

The results of the laboratory testing of rock cores are summarized in Table 3-4. The laboratory testing of rock core data is presented in Appendix J for Chevy Chase and Appendix O for Silver Spring.

3.3.3. Storage Of Soil Samples And Rock Cores

Soil and rock core samples are stored at a storage facility Unit No. 1164 located at 25 Fontana Lane, Baltimore, Maryland 21237. This is a combined storage facility that also includes soil and rock core samples from MTA's planning study for the Baltimore Red Line Project. The soil and rock samples will be stored at this location until further arrangements are made.



Table 3-4: Summary of Laboratory Testing Results on Rock Samples

Boring Number	Sample Number	Sample Depth (feet)	Unconfined Compressive Strength (psi) ASTM D2938
Chevy Chase			
Samples Tested by E2CR, Inc.			
Jones 1	R-4	57.5	4,400
Jones 2	R-2	47.0	2,160
Jones 2	R-6	61.0	1,810
Silver Spring			
Samples Tested by E2CR, Inc.			
Manchester 1	R-1	51.5	3,850
Manchester 1	R-3	61.0	2,720
Manchester 1	R-7	75.5	2,000
Manchester 2	R-2	26.0	2,890
Manchester 2	R-4	42.0	7,520
Manchester 2	R-6	51.0	3,580
Manchester 2	R-7	55.0	320
Manchester 2	R-10	70.0	3,970
Manchester 3	R-3	45.5	3,850
Manchester 3	R-5	58.5	3,580
Manchester 3	R-7	69.0	2,850
Manchester 3	R-10	82.5	7,460
Manchester 3	R-12	93.0	3,040
Manchester 4	R-1	38.5	2,400
Manchester 4	R-3	48.0	4,400
Manchester 4	R-7	66.0	2,690
Manchester 4	R-8	70.0	6,060
Manchester 4	R-9	76.5	7,640
Plymouth 1	R-1	47.0	3,210
Plymouth 1	R-4	64.0	9,190
Plymouth 2	R-3	62.5	1,350
Plymouth 2	R-5	74.0	1,070
Plymouth 2	R-9	85.0	4,470
Plymouth 3	R-1	42.0	4,810
Plymouth 3	R-3	50.0	3,450
Plymouth 3	R-5	64.0	5,890

**Table 3-4: Summary of Laboratory Testing Results on Rock Samples
(continued)**

Boring Number	Sample Number	Sample Depth (feet)	Unconfined Compressive Strength (psi) ASTM D2938
Silver Spring			
Samples Tested by E2CR, Inc.			
SS/T 1	R-1	46.5	1,310
SS/T 1	R-4	60.0	3,990
SS/T 1	R-5	68.0	7,150
SS/T 2	R-2	34.8	2,450
SS/T 2	R-7	58.5	10,970
SS/T 2	R-10	75.0	3,410
SS/T 3	R-2	39.0	4,410
SS/T 3	R-3	40.0	3,590
SS/T 3	R-6	57.5	4,460
SS/T 3	R-11	83.5	9,960
SS/T 4	R-4	30.0	5,660
SS/T 4	R-8	44.0	8,360
SS/T 4	R-12	73.5	5,670
SS/T 5	R-2	15.5	650
SS/T 5	R-5	34.0	7,480
SS/T 5	R-9	54.5	11,040
SS/T 5	R-13	70.5	8,580
SS/T 6	R-1	18.5	3,350
SS/T 6	R-2	20.0	3,740
Wayne 3	R-2	13.8	5,520
Wayne 3	R-5	28.5	3,410
Wayne 3	R-9	48.5	3,760
Wayne 3	R-13	65.5	20,510
Wayne 4	R-2	28.5	2,790
Wayne 4	R-4	35.0	7,120
Wayne 4	R-6	47.0	1,920
Wayne 4	R-10	68.1	4,250
Wayne 4	R-14	87.0	510



**Table 3-4: Summary of Laboratory Testing Results on Rock Samples
(continued)**

Boring Number	Sample Number	Sample Depth (feet)	Unconfined Compressive Strength (psi) ASTM D2938
Silver Spring			
Samples Tested by E2CR, Inc.			
Wayne 5	R-2	19.0	1,560
Wayne 5	R-4	27.0	5,870
Wayne 5	R-5	30.0	6,970
Wayne 5	R-9	50.0	13,040
Samples Tested by The Robert B. Balter Company			
Manchester 1	R-6	78.0	7,377
Manchester 2	R-7	60.0	5,644
Manchester 3	R-7	68.5	11,285
Manchester 3	R-12	94.0	16,606
Manchester 4	R-7	66.5	13,971
Plymouth 2	R-4	64.0	1,460
Plymouth 2	R-7	75.0	6,288
SS/T 1	R-1	46.0	2,892
SS/T 1	R-4	61.5	6,717
SS/T 2	R-2	36.0	14,149
SS/T 2	R-10	75.8	14,857
SS/T 3	R-3	41.0	8,679
SS/T 5	R-2	16.5	13,449
Wayne 3	R-5	28.0	9,400
Wayne 3	R-9	49.0	12,079
Wayne 3	R-13	66.0	15,482
Wayne 4	R-3	29.8	4,348
Wayne 4	R-6	46.0	11,143
Wayne 4	R-14	85.0	13,653
Wayne 5	R-2	18.0	12,786
Wayne 5	R-9	51.0	15,854

4. Results of Subsurface Investigation

This Geotechnical Data Technical Report is a compilation of factual data and test results without interpretation. The results of these investigations will be used in the tunnel feasibility studies and may be used in later planning or design phases of the project.

5. References

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Appendix A

Historic Data Chevy Chase Area

State of Maryland – Department of Transportation



Mass Transit Administration

**GEORGETOWN BRANCH
TROLLEY/TRAIL PROJECT**

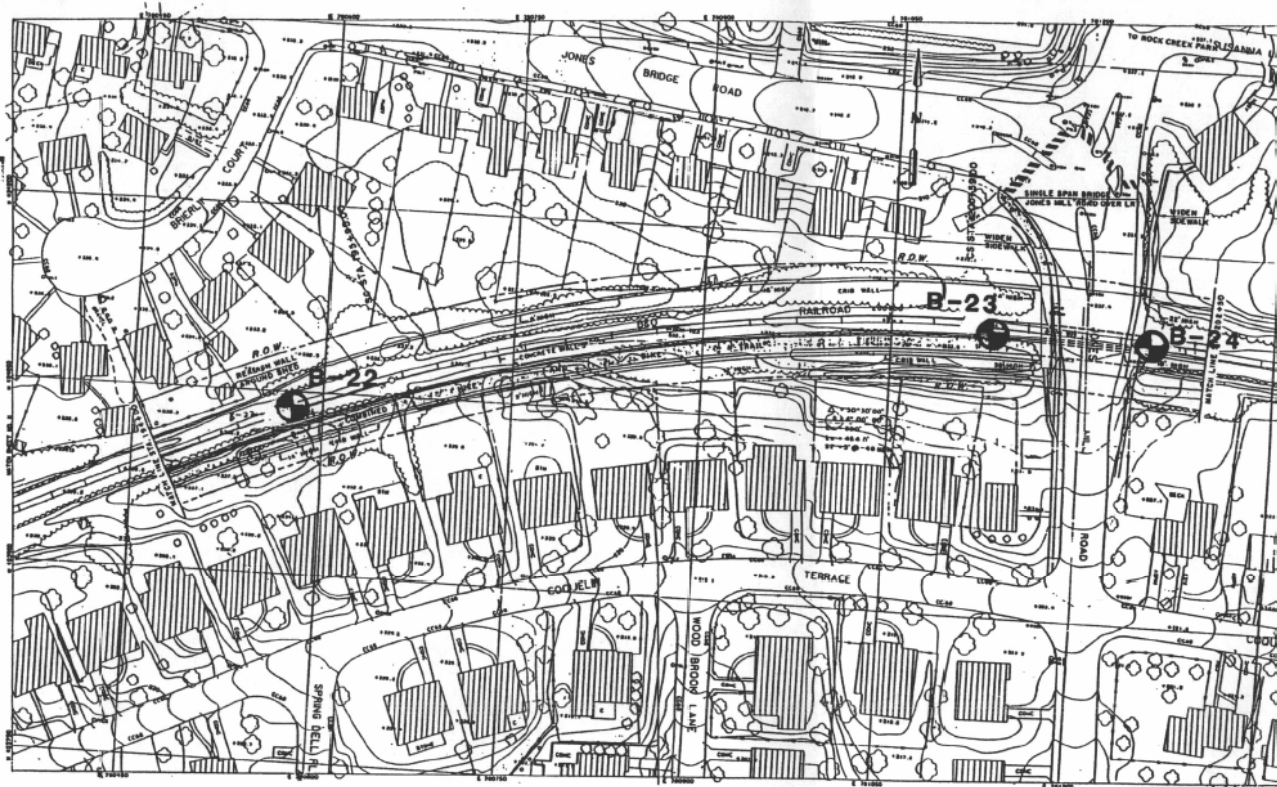
**PRELIMINARY SUBSURFACE
INVESTIGATION REPORT**

DRAFT

Prepared by:



BECHTEL CORPORATION
Job 20926
October 1990



FOR LEGEND SEE FIGURE 1

BECHTEL
GAITHERSBURG, MARYLAND

GEORGETOWN BRANCH
TROLLEY / TRAIL
MONTGOMERY COUNTY, MARYLAND

BORING LOCATION PLAN



JOB No.
20926

DRAWING No.
FIGURE 12

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG		Project: GEORGETOWN BRANCH TROLLEY/TRAIL		Contract Number: M901038 Boring Number: 23 Sheet: 1 Of 2	
--	--	--	--	--	--

Boring Contractor: Foundation Test Service, Inc. Boring Foreman: R. Stidham Drilling Method: 3 1/2" HOLLOW STEM AUGER Drilling Equipment: CME 45 SEA Representative: L. Hogg Dates Started: 08/15/90 Completed: 08/15/90 Location: Jones Mill Road Study Ground Surface Elevation: 235.2 ±		Groundwater Observations				
		Date	Time	Depth	Casing	Caved
		Encountered	8/15	9:30	32.5	34.0
		Completion	8/15	1:05	35.4	49.0
		Casing Pulled	8/15	1:45	20.6	None 30.1
			8/16	11:45	25.7	None 28.4

DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRA-TUM	SAMPLING DATA	W (%)	REMARKS
1.5	silty sand FILL with cinders and gravel, moist, black		233.7	A1	2+4+4		
	silty SAND, moist, brown	SM			2+4+4	22.3	
				C	3+2+6	8.5	
					9+14+17		
14.5	DISINTEGRATED ROCK, moist, brown		220.7		21+32+30	4.3	
				D	20+100/11"	8.0	
					18+36+51		
					100/10"		
34.0	silty SAND, wet, brown and gray	SM	201.2	C	25+21+15		
39.0	DISINTEGRATED ROCK, moist, brown and gray		196.2	D	100/8"		
					100/5"		
49.1	soft, closely fractured SCHIST		186.1		100/1 1/2" NX		*Refusal

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG			Project: GEORGETOWN BRANCH TROLLEY/TRAIL			Contract Number: M901038 Boring Number: 23 Sheet: 2 Of 2		
DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRATUM	DEPTH	SAMPLING DATA	W (%)	REMARKS
	ROCK, moderately weathered, gray			E		REC = 97 % RQD = 15 %		
58.7			176.5		-55 -	NX		
59.1	very soft, intensely fractured SCHIST ROCK, severely weathered, gray		176.1			REC = 100 % RQD = 56 %		
	BOTTOM OF BORING @ 59.1 FT.							

Comments:

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG		Project: GEORGETOWN BRANCH TROLLEY/TRAIL		Contract Number: M901038 Boring Number: 24 Sheet: 1 Of 2	
--	--	---	--	---	--

Boring Contractor: Foundation Test Service, Inc. Boring Foreman: R. Stidham Drilling Method: 3½" HOLLOW STEM AUGER Drilling Equipment: CME 45 SEA Representative: L. Hogg Dates Started: 08/16/90 Completed: 08/16/90 Location: Jones Mill Road Study Ground Surface Elevation: 236.1 ±		Groundwater Observations					
		Date	Time	Depth	Casing	Caved	
		Encountered	8/16	7:50	32.8	34.5	
		Completion	8/16	11:05	26.2	40.4	
		Casing Pulled	8/16	11:35	26.5	None 37.5	
			8/17	12:35	24.0	None 39.0	

DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRA-TUM	SAMPLING DEPTH	DATA	W (%)	REMARKS
2.0	silty sand FILL, with cinders and gravel, moist, brown and black		234.1	A1	—	3+5+6		
	sandy SILT, moist, brown	ML			— 5 —	2+4+5		
					—	3+4+8	21.7	
					— 10 —	3+4+6		
14.5	silty SAND, moist, brown and gray	SM	221.6	C	— 15 —	5+6+11	13.2	
					— 20 —	13+16+27		
24.5	DISINTEGRATED ROCK, moist, brown and gray		211.6		— 25 —	22+44+56		
				D	— 30 —	100/8½"		
					— 35 —	100/5"		
40.5	soft, closely to moderately fractured SCHIST ROCK, severely weathered, brown		195.6	E	— 40 —	100/2½" 100/1½"		*Refusal
						NX REC = 55 % RQD = 18 %		
47.0	Very soft, closely fractured SCHIST ROCK, moderately weathered, gray		189.1		— 45 —	NX REC = 78 % RQD = 0 %		
50.5			185.6		— 50 —			

SCHNABEL ENGINEERING ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS TEST BORING LOG		Project: GEORGETOWN BRANCH TROLLEY/TRAIL				Contract Number: M901038 Boring Number: 24 Sheet: 2 Of 2		
DEPTH (FT.)	STRATA DESCRIPTION	CLASS.	ELEV. (FT.)	STRA- TUM	SAMPLING DEPTH DATA		W (%)	REMARKS
	<div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> <div style="position: absolute; top: 5px; left: 5px; width: 40%; height: 10px; border: 1px solid black;"></div> <div style="position: absolute; top: 10px; left: 5px;">BOTTOM OF BORING @ 50.5 FT.</div> </div>							

Comments:

SUMMARY OF SOIL LABORATORY RESULTS

Contract #901038

BORING NO.	DEPTH (ft.)	SAMPLE TYPE	DESCRIPTION OF SOIL SPECIMEN	STRATUM DESIGNATION	PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS			NATURAL MOISTURE (%)	PROCTOR		CALIFORNIA BEARING RATIO			REMARKS
						LL	PL	PI		MAX DRY DENSITY (pcf)	OPT. M.C. (%)	CBR @ 0.20"	SWELL (%)	RELATIVE COMPACTION (%)	
24	2.0-10.0	BULK	sandy SILT (ML), brown	C	54.6	44	28	16	23.8	108.5	18.2	4.7	0.3	98	See: Gradation, Moisture-Density Relation and CBR Curves
20, 21, 22	—	BULK	CINDERS, dark grey	A	10.7	NP	NP	NP	18.4	96.4	17.8	—	—	—	See: Gradation and Moisture-Density Relation Curves

NOTES:

1. Soil tests in accordance with applicable ASTM or AASHTO standards.
2. Soil classification symbols are in accordance with Unified and AASHTO classification systems, based on testing indicated and visual identification.
3. Visual identification of samples is in accordance with the system used by this firm.
4. Key to abbreviations: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; NP = Nonplastic; CBR = California Bearing Ratio; VTM = Virginia Test Method

SUMMARY OF SOIL LABORATORY RESULTS

Contract #901038

BORING NO.	DEPTH (ft.)	SAMPLE TYPE	DESCRIPTION OF SOIL SPECIMEN	STANDARD DESIGNATION	PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS			NATURAL MOISTURE (%)	NATURAL DENSITY		Gs	ORGANIC CONTENT (%)	REMARKS
						LL	PL	PI		WET (pcf)	DRY (pcf)			
23	6.0-9.0	JAR	silty SAND (SM), brown	C	43.4	NP	NP	NP	8.5	—	—	2.74	—	See Gradation Curves
24	6.0-9.5	JAR	sandy SILT (ML), red-brown	C	62.4	40	27	13	21.7	—	—	2.62	—	See Gradation Curves
24	14.5-16.0	JAR	silty SAND (SM) with weathered rock fragments, brown	C	12.8	NP	NP	NP	13.2	—	—	—	—	See Gradation Curves
25	4.0	JAR	CINBERS, dark gray	A	—	—	—	—	20.9	—	—	—	4.8	

NOTES:

1. Soil tests in accordance with applicable ASTM or AASHTO standards.
2. Soil classification symbols are in accordance with Unified and AASHTO classification systems, based on testing indicated and visual identification.
3. Visual identification of samples is in accordance with the system used by this firm.
4. Natural moisture content determinations were performed on samples from Boring Nos. 1, 23 and 25. Results are shown on the test boring report.
5. Key to abbreviations: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; NP = Nonplastic; Gs = Specific Gravity.

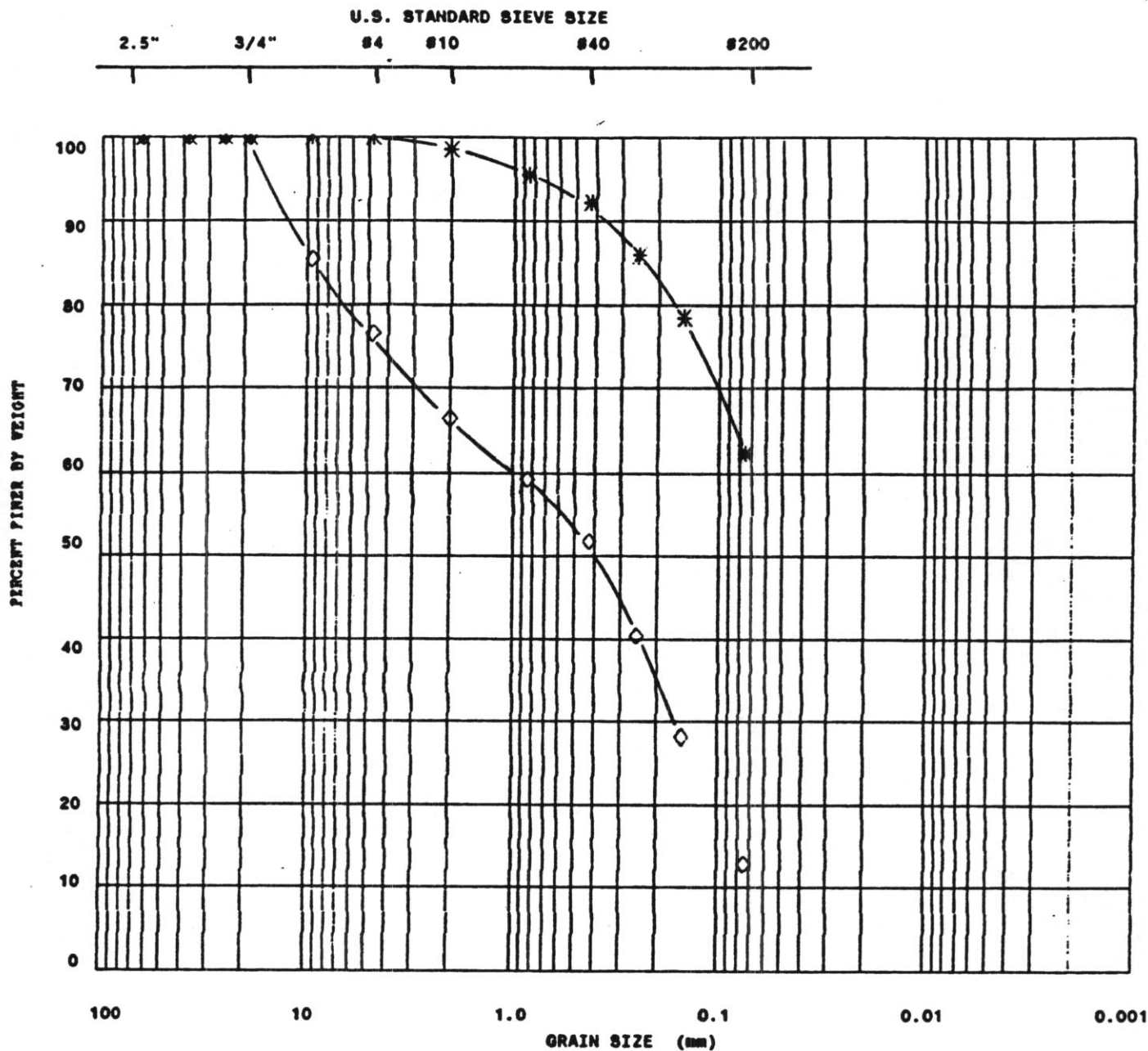
SUMMARY OF SOIL LABORATORY RESULTS

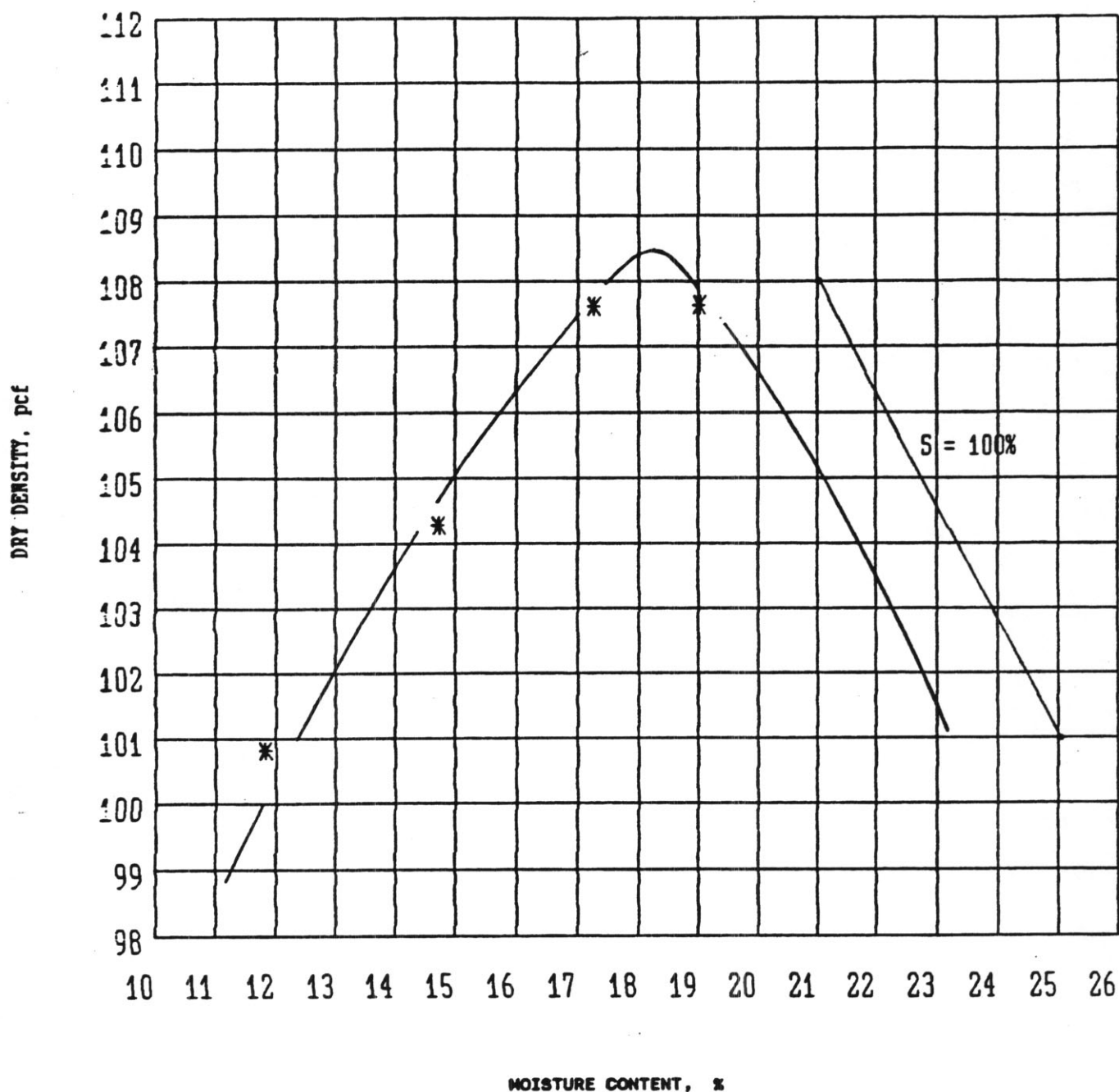
Contract #901038

BORING NO.	DEPTH (ft.)	SAMPLE TYPE	DESCRIPTION OF SOIL SPECIMEN	STRATUM DESIGNATION	PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS			NATURAL MOISTURE (%)	CORROSION POTENTIAL AND CHEMICAL TESTING					REMARKS
						LL	PL	PI		RESISTIVITY (AT NATURAL MOISTURE) (ohm-cm)	RESISTIVITY (SATURATED) (ohm-cm)	pH	SULFATES mg/kg	CHLORIDES mg/kg	
24	24.5-29.5	JNR	DISINTIGRATED ROCK, brown and grey	D	—	—	—	—	—	44,500	13,000	6.9	ND	ND	
27-A	21.5-23.0	JNR	sandy lean clay FILL, brown	AI	—	—	—	—	—	12,000	2,300	6.0	ND	ND	
31	3.0-4.5	JNR	sandy SILT (ML), grey and white	C	—	—	—	—	—	20,500	11,000	7.0	ND	ND	
36	2.0	JNR	CINDERS, dark grey	A	—	—	—	—	—	1,800	450	7.6	ND	ND	
40	13.5	JNR	sandy SILT (ML), brown	C	—	—	—	—	—	19,000	17,000	6.8	ND	ND	

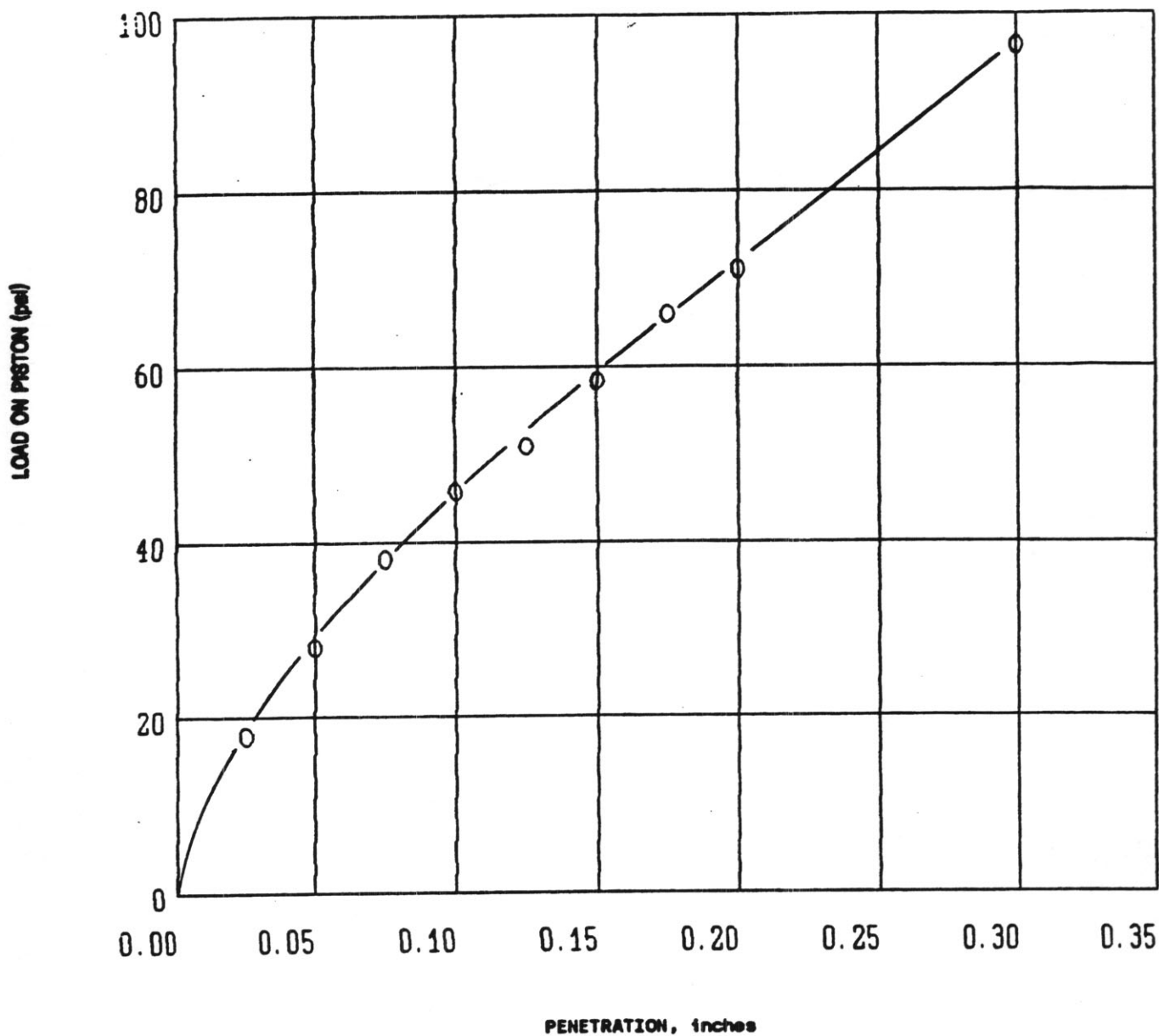
NOTES:

1. Soil tests in accordance with applicable ASTM or AASHTO standards.
2. Soil classification symbols are in accordance with Unified and AASHTO classification systems, based on testing indicated and visual identification.
3. Visual identification of samples is in accordance with the system used by this firm.
4. Natural moisture content determinations were performed on samples from Boring Nos. 1, 23 and 25. Results are shown on the test boring report.
5. Key to abbreviations: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; NP = Nonplastic; DL = Detection Limit; ND = Not detected at or above listed detection limit.
6. Samples for Chloride and Sulfate content were submitted to SPECTRALYTIX, INC. for testing.





DESCRIPTION OF SAMPLE:		SCHNABEL ENGINEERING ASSOCIATES	
sandy SILT, brown		MOISTURE DENSITY RELATIONS	
CLASSIFICATION: ML		SPECIFICATION: ASTM D698 METHOD: A	
SAMPLE NO.: 24	SPECIFIC GRAVITY: 2.72 ASSUMED		Project: GEORGETOWN BRANCH TROLLEY/TRAIL
SOURCE: ON SITE	LIQUID LIMIT: 44 PLASTICITY INDEX: 16		
% PASSING 3/4 in.: 100	MAX. DRY DENSITY, pcf: 108.5		
% PASSING No. 4: 97.4	OPT. MOIST. %: 18.2		
		Contract No.: M901038	



DESCRIPTION OF SAMPLE:			SCHNABEL ENGINEERING ASSOCIATES	
sandy SILT, brown			CALIFORNIA BEARING RATIO	
CLASSIFICATION: ML			SPECIFICATION: ASTM D1883	
BORING NO.:	24	DEPTH:	Project:	
SURCHARGE, psf:	125	CBR (SOAKED):		
SOAKING TIME :	4 days	SWELL, %:		
DRY DENSITY, pcf		MOISTURE CONTENT, %		GEORGETOWN BRANCH TROLLEY/TRAIL
BEFORE SOAKING:	106.7	BEFORE SOAKING:	18.6	
AFTER SOAKING:	106.4	AFTER SOAKING:	19.9	
MAX. DRY DENSITY:	108.5	OPT. MOISTURE:	18.2	
Contract No.: M901038				



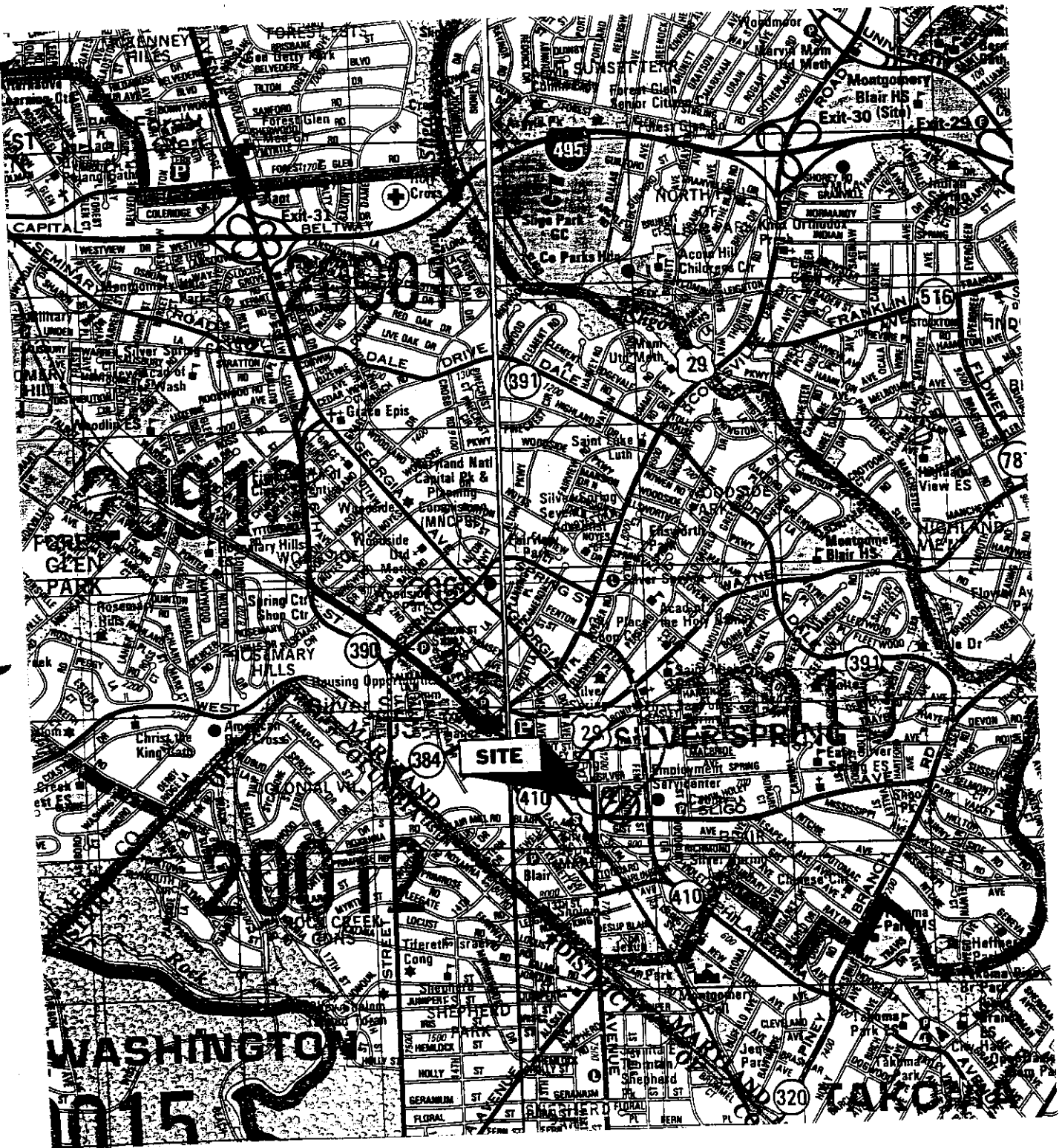
Appendix B

Historic Data Silver Spring Area

Supplemental Preliminary
Geotechnical Engineering Study
Thayer Avenue Site
Montgomery County, Maryland
HCEA Job No. 99424A

Prepared for:

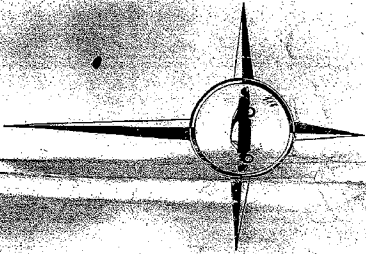
Michael, LLC
801 Wayne Avenue, Suite 300
Silver Spring, Maryland 20910



PROJECT LOCATION MAP

HILLIS-CARNES
ENGINEERING ASSOCIATES, INC.

Scale: 1" = 2000'± Date: 1/03/00 Figure:1



HILLIS-CARNES
ENGINEERING ASSOCIATES, INC.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue Property- Addition Boring No. A-1
Montgomery County, MD Job # 99424B

SAMPLER
 Datum _____ Hammer Wt. 140 lbs. Hole Diameter 6 Foreman Lamont Smith
 Surf. Elev. _____ Ft. Hammer Drop 30 in. Rock Core Diameter _____ Inspector _____
 Date Started 6/24/05 Pipe Size 2 in. Boring Method HSA Date Completed 6/24/05

Elevation/ Depth	SOIL SYMBOLS/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	SPT Blows/Foot	
							N	Curve
								10 30 50
0		Brown to light brown, moist, medium stiff to stiff, micaceous sandy silt, trace clay, trace to no rock fragments and gravel (ML) Light brown to tan, moist, medium dense to loose, micaceous silty sand to sandy silt (SM-ML)	Gravel-4"	7"		3-3-4	7	
				15"		4-6-7	13	
				18"		5-6-7	13	
7.5				14"		4-5-5	10	
				14"		4-5-6	11	
		Tan to light brown to gray to reddish brown, moist, very dense to dense to very dense, micaceous sandy silt (SM; Decomposed Rock)		13"		18-23-51/4"	100+	100
15				18"		27-30-51/6"	100+	100
				9"		35-51/3"	100+	100
22.5				12"		13-20-15	35	
30				4"		51/4"	100+	100
37.5		Auger refusal @ 40.0' Bottom of hole @ 40.0'	Groundwater encountered @ 34.0'	0"		51/0"	100+	100
45								

DRAFT

SAMPLER TYPE
 DRIVEN SPLIT SPOON UNLESS OTHERWISE
 PT - PRESSED SHELBY TUBE
 CA - CONTINUOUS FLIGHT AUGER
 RC - ROCK CORE

SAMPLE CONDITIONS
 D - DISINTEGRATED
 I - INTACT
 U - UNDISTURBED
 L - LOST

AT COMPLETION
 AFTER 24 HRS.
 AFTER _____ HRS.

**GROUND
WATER**
Dry ft.
Dry ft.
 _____ ft.

**CAVE IN
DEPTH**
 _____ ft.
20.0 ft.
 _____ ft.

BORING METHOD
 HSA - HOLLOW STEM AUGERS
 CFA - CONTINUOUS FLIGHT AUGER
 DC - DRIVING CASING
 MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1" WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue Property- Addition Boring No. A-2
 Location Montgomery County, MD Job # 99424B

SAMPLER
 Datum _____ Hammer Wt. 140 lbs. Hole Diameter 6 Foreman Lamont Smith
 Surf. Elev. _____ Ft. Hammer Drop 30 in. Rock Core Diameter _____ Inspector _____
 Date Started 6/24/05 Pipe Size 2 in. Boring Method HSA Date Completed 6/24/05

Elevation/ Depth	SOIL SYMBOLS/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	SPT Blows/Foot Curve	
							N	
0		Reddish brown, moist, stiff, micaceous sandy silt, trace clay (ML)	Gravel-4"	10"		5-6-6	12	10
		Light brown to reddish brown, moist, medium dense to dense, micaceous silty sand (SM)	No groundwater encountered while drilling.	13"		9-11-9	20	30
				15"		8-9-9	18	
7.5				16"		17-18-19	37	
				13"		7-8-7	15	
15				16"		18-22-23	45	
		Reddish brown to gray, moist, very dense, micaceous silty sand (Decomposed Rock)		12"		32-51/6"	100+	100+
22.5				11"		40-51/5"	100+	100+
30				4"		51/4"	100+	100+
37.5				0"		51/0"	100+	100+
45		Auger refusal @ 40.0' Bottom of hole @ 40.0'		0"		51/0"	100+	100+

DRAFT

SAMPLER TYPE
 DRIVEN SPLIT SPOON UNLESS OTHERWISE
 PT - PRESSED SHELBY TUBE
 CA - CONTINUOUS FLIGHT AUGER
 RC - ROCK CORE

SAMPLE CONDITIONS
 D - DISINTEGRATED
 I - INTACT
 U - UNDISTURBED
 L - LOST

AT COMPLETION
 AFTER 24 HRS.
 AFTER _____ HRS.

GROUND WATER
Dry ft.
CAVE IN DEPTH
22.0 ft.
20.5 ft.
 _____ ft.

BORING METHOD
 HSA - HOLLOW STEM AUGERS
 CFA - CONTINUOUS FLIGHT AUGERS
 DC - DRIVING CASING
 MD - MUD DRILLING

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Client Name Thayer Avenue Property- Addition Boring No. A-3
 Location Montgomery County, MD Job # 99424B

SAMPLER

Datum _____ Hammer Wt. 140 lbs. Hole Diameter 6 Foreman Lamont Smith
 S. Elev. _____ Ft. Hammer Drop 30 in. Rock Core Diameter _____ Inspector _____
 Date Started 6/23/05 Pipe Size 2 in. Boring Method HSA Date Completed 6/23/05

Date Started

0/25/00

Elevation/ Depth	SOIL SYMBOLS/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	SPT Blows/Foot		
							N	Curve	
							10	30	50
0	D	Brown, moist, stiff to medium stiff, micaceous sandy silt, trace to no clay and gravel (ML)	Gravel-2"	12"		14-13-9	22		
	D		No groundwater encountered while drilling.	10"		5-6-7	13		
	D			6"		4-5-4	9		
7.5	D	Reddish brown, moist, dense, micaceous silty sand (SM)		13"		9-13-24	37		
	D	Reddish brown to tan to light gray to light brown to dark gray, moist, very dense, micaceous silty sand (Decomposed Rock)		10"		40-51/4"	100+		
	D								
15	D			11"		14-51/5"	100+		
	D			5"		51/5"	100+		
22.5	D			9"		20-51/3"	100+		
	D			2"		51/2"	100+		
30	D			0"		51/0"	100+		
	L	Auger refusal @ 35.0 Bottom of hole @ 35.0'							
37.5									
45									

DRAFT

DRAFT

SAMPLER TYPE

DRIVEN SPLIT SPOON UNLESS OTHERWISE
 PT - PRESSED SHELBY TUBE
 CA - CONTINUOUS FLIGHT AUGER
 RC - ROCK CORE

SAMPLE CONDITIONS

D - DISINTEGRATED
 I - INTACT
 U - UNDISTURBED
 L - LOST

AT COMPLETION

AFTER 24 HRS.
 AFTER ____ HRS.

GROUND WATER

Dry ft.
 Dry ft.
 ft.

CAVE IN DEPTH

22.5 ft.
 23.0 ft.
 ft.

BORING METHOD

HSA - HOLLOW STEM AUGERS
 CFA - CONTINUOUS FLIGHT AUGERS
 DC - DRIVING CASING
 MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue Property- Addition Boring No. A-4
 Location Montgomery County, MD Job # 99424B

SAMPLER
 Datum _____ Hammer Wt. 140 lbs. Hole Diameter 6 Foreman Lamont Smith
 Elev. _____ Ft. Hammer Drop 30 in. Rock Core Diameter _____ Inspector _____
 Date Started 6/23/05 Pipe Size 2 in. Boring Method HSA Date Completed 6/23/05

Elevation/ Depth	SOIL SYMBOLS/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	SPT Blows/Foot Curve	
							N	Curve
0		Light brown, moist, stiff, micaceous sandy silt (ML)	Gravel-2"	13"		8-17-9	26	
		Tan to reddish brown, moist, medium dense, micaceous silty sand; S-6 trace rock fragments (SM)	No groundwater encountered while drilling.	14"		7-8-9	17	
				13"		7-9-8	17	
7.5				15"		7-7-8	15	
				15"		7-8-12	20	
15				17"		6-5-8	13	
		Reddish brown to light gray, moist, very dense, micaceous silty sand (Decomposed Rock)		4"		51/4"	100+	
22.5				12"		18-51/6"	100+	
30				0"		51/0"	100+	
		Auger refusal @ 32.5' Bottom of hole @ 32.5'		0"		51/0"	100+	
37.5								
45								

DRAFT

SAMPLER TYPE

DRIVEN SPLIT SPOON UNLESS OTHERWISE
 PT - PRESSED SHELBY TUBE
 CA - CONTINUOUS FLIGHT AUGER
 RC - ROCK CORE

SAMPLE CONDITIONS

D - DISINTEGRATED
 I - INTACT
 U - UNDISTURBED
 L - LOST

AT COMPLETION

AFTER 24 HRS.
 AFTER _____ HRS.

GROUND WATER

Dry ft.
Dry ft.
 _____ ft.

CAVE IN DEPTH

21.5 ft.
22.5 ft.
 _____ ft.

BORING METHOD

HSA - HOLLOW STEM AUGERS
 CFA - CONTINUOUS FLIGHT AUGERS
 DC - DRIVING CASING
 MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1" WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue Property- Addition Boring No. A-5
 Location Montgomery County, MD Job # 99424B
 Date 6/28/05 Hammer Wt. 140 lbs. Hole Diameter 6 Foreman Lamont Smith
 Surf. Elev. Ft. Hammer Drop 30 in. Rock Core Diameter Inspector
 Date Started 6/28/05 Pipe Size 2 in. Boring Method HSA Date Completed 6/28/05

Elevation/ Depth	SOIL SYMBOLS/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	SPT Blows/Foot Curve	
							N	10 30 50
0	D	Brown to light brown, moist, stiff, micaceous sandy silt, trace clay, organics and gravel (ML)	Topsoil-4"	10"		4-6-14	20	
	D			12"		10-6-5	11	
	D	Light brown, moist, stiff to medium stiff, micaceous sandy silt (ML)		16"		3-5-6	11	
	D			14"		3-4-5	9	
7.5	D	Light brown, damp, stiff, micaceous clayey silt (ML-CL)		15"		3-5-7	12	
	D	Gray, damp, medium stiff, micaceous sandy silt (ML)	Groundwater encountered @ 13.0'	15"		2-4-4	8	
15	D			18"		4-6-12	18	
	D	Gray to light brown, damp to moist, medium dense to very dense, micaceous silty sand to sandy silt (SM-ML)		18"		7-16-20	36	
22.5	D			0"		51/0"	100/93	
30	L	Auger refusal @ 27.0' Light to Dark Gray with Black, Yellowish Brown, Hard, Fine- to Medium-Grained, Slightly Fractured, Quartz-Feldspar, Micaceous, Gneiss with areas of Schistosity. Bottom of hole at 32.0'	Rock cored from 27.0' to 32.0'. Recovered 60" = 100% RQD = 56" = 93%					
37.5								
45								

SAMPLER TYPE

DRIVEN SPLIT SPOON UNLESS OTHERWISE
 PT - PRESSED SHELBY TUBE
 CA - CONTINUOUS FLIGHT AUGER
 RC - ROCK CORE

SAMPLE CONDITIONS

D - DISINTEGRATED
 I - INTACT
 U - UNDISTURBED
 L - LOST

AT COMPLETION
 AFTER 24 HRS.
 AFTER ____ HRS.

GROUND WATER

12.5 ft.
 ft.
 ft.

CAVE IN DEPTH

13.0 ft.
 ft.
 ft.

BORING METHOD

HSA - HOLLOW STEM AUGERS
 CFA - CONTINUOUS FLIGHT AUGERS
 DC - DRIVING CASING
 MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-1
Job # 99424A

Sampler
a m
u... Elev.
ate Started

Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD

Hole Diameter 8"
Rock Core Dia -
Boring Method HSA

Foreman Palmer Stephens
Inspector
Complete 12-16-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, loose to medium dense micaceous fine silty sand (SM)			D	5-4-4	1	12"	4" Gravel
				D	8-10-10	2	14"	No groundwater encountered while drilling
			5.0					
				D	10-10-10	3	14"	Caved in at 32.0' at Completion
				D	7-8-14	4	16"	
			10.0					
				D	9-11-13	5	14"	
			15.0					
	Brown/Gray, moist, very dense, micaceous silty sand with rock fragments (SM) Decomposed Rock			D	20-30-40	6	16"	Backfilled at completion
			20.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT. PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-1
Job # 99424A

Sampler
Hole Diameter 8"
Rock Core Dia -
Boring Method HSA
Foreman Palmer Stephens
Inspector -
Complete 12-16-99

Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD

Start Date 12-16-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
				D	51/5"	7	5"	
	Brown/Gray, moist, very dense, micaceous silty sand with rock fragments (SM)							
	Decomposed Rock							
			25.0					
				D	51/3"	8	3"	
			30.0					
				D	51/2"	9	2"	
			35.0					
				L	51/0"	10	No Rec	
		35.5						
	Spoon Refusal at 35.0' Auger Refusal at 35.5'							
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT. COMPRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
C-ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Boring Number **B-2**
Job # **99424A**

Project Name **Thayer Avenue**
Location **Silver Spring, Maryland**

Date Started 12-17-99	Hammer Wt. 140 Lbs.	SAMPLER	Hole Diameter 8"	Foreman Palmer Stephens
	Hammer Drop 30 Inches		Rock Core Dia -	Inspector
	Pipe Size 2.0 Inches OD		Boring Method HSA	Complete 12-17-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Gray to tan, moist, medium stiff silt trace clay, gravel, wood (Fill)			D	10-4-2	1	6"	4" Asphalt
		4.0		D	2-4-2	2	10"	Groundwater encountered at 15.0' while drilling
	Light Brown/Gray, moist, loose to very dense, micaceous silty sand with rock fragments (SM)		5.0	D	4-4-5	3	16"	Caved in at 22.0' at Completion
				D	3-4-5	4	16"	Backfilled at completion
			10.0	D	4-8-9	5	18"	
			15.0	D	6-5-8	6	18"	
			20.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT-PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 19.0' FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Boring Number B-2
Job # 99424A

Project Name Thayer Avenue
Location Silver Spring, Maryland

Sampler
Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD
Hole Diameter 8"
Rock Core Dia -
Boring Method HSA
Foreman Palmer Stephens
Inspector -
Complete 12-17-99
Date Started 12-17-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Light Brown/Gray, moist, loose to very dense, micaceous silty sand with rock fragments (SM)			D	15-21-22	7	16"	
		24.0			51/0"	8	No Rec	
	Auger and Spoon Refusal at 24.0'		25.0					
			30.0					
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 19.0' FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

Page 1 of 2

Boring Number **B-3**
Job # **99424A**

Foreman	<u>Palmer Stephens</u>
Inspector	<u></u>
Complete	<u>12-16-99</u>

		SAMPLER				
it		Hammer Wt.	140	Lbs.	Hole Diameter	8"
ir... Elev.		Hammer Drop	30	Inches	Rock Core Dia	-
ate Started	12-16-99	Pipe Size	2.0	Inches OD	Boring Method	HSA

SAMPLER TYPE

SAMPLE CONDITIONS

GROUND WATER DEPTH

AT COMPLETION _____ Dry _____ FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30";COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-3
Job # 99424A

Drum	Hammer Wt. <u>140</u> Lbs.	SAMPLER	Hole Diameter <u>8"</u>	Foreman <u>Palmer Stephens</u>
3rd Elev.	Hammer Drop <u>30</u> Inches		Rock Core Dia <u>-</u>	Inspector
Date Started <u>12-16-99</u>	Pipe Size <u>2.0</u> Inches OD		Boring Method <u>HSA</u>	Complete <u>12-16-99</u>

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown/Gray, very dense, micaceous silty sand with rock fragments (SM)			D	23-51/4"	7	10"	
	Decomposed Rock							
		25.2	25.0	D	51/2"	8	2"	
	Bottom of Hole at 25.2'							
			30.0					
			35.0					
			40.0					

SAMPLER TYPE
☐ DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED.
☐ T-PRESSED SHELBY TUBE
☐ CONTINUOUS FLIGHT AUGER
☐ ROCK CORE

SAMPLE CONDITIONS
☐ D-DISINTEGRATED
☐ I-INTACT
☐ U-UNDISTURBED
☐ L-LOST

GROUND WATER DEPTH
 AT COMPLETION Dry FT.
 AFTER FT.
 AFTER FT.

BORING METHOD
☒ HSA-HOLLOW STEM AUGERS
☐ CFA-CONT. FLIGHT AUGERS
☐ DC-DRIVING CASING
☐ MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-4
Job # 99424A

Drum S. f. Elev. Date Started		Hammer Wt.	<u>140</u>	Lbs.	Hole Diameter	<u>4"</u>	Foreman	<u>Lamont Smith</u>
		Hammer Drop	<u>30</u>	Inches	Rock Core Dia	<u>-</u>	Inspector	
		Pipe Size	<u>2.0</u>	Inches OD	Boring Method	<u>HSA</u>	Complete	<u>11-18-99</u>
	<u>11-18-99</u>							

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, medium dense, fine silty sand, little mica (SM)			I/D	6-6-8	1	13"	5" Asphalt
				I/D	5-8-8	2	14"	No groundwater encountered while drilling
			5.0					
				D	5-5-7	3	16"	Caved in at 13.5' at Completion
				D	7-8-10	4	14"	
			10.0					
				D	7-9-12	5	12"	
			15.0					
				D	11-12-15	6	15"	Backfilled at completion
		17.5						
	Brown, moist, very dense, micaceous silty sand with rock fragments (SM)							
	Decomposed Rock		20.0					

SAMPLER TYPE

DRIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT-PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-4
Job # 99424A

Sampler
Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD
Hole Diameter 4"
Rock Core Dia -
Boring Method HSA
Foreman Lamont Smith
Inspector -
Complete 11-18-99
Date Started 11-18-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown, moist, very dense, micaceous silty sand with rock fragments (SM)			D	51/4"	7	4"	
	Decomposed Rock							
			25.0					
				D	35-51/6"	8	10"	
		26.0						
	Bottom of Test Hole at 26.0'							
			30.0					
			35.0					
			40.0					

SAMPLER TYPE
DRIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT-PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS
D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH
AT COMPLETION Dry FT.
AFTER FT.
AFTER FT.

BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-5
Job # 99424A

Dr. m _____ Hammer Wt. 140 Lbs. Hole Diameter 4"
St. Elev. _____ Hammer Drop 30 Inches Rock Core Dia -
Date Started 11-18-99 Pipe Size 2.0 Inches OD Boring Method HSA
Foreman Lamont Smith
Inspector _____
Complete 11-18-99

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, medium dense micaceous silty sand (SM)	2.5		D	5-4-7	1	10"	7" Asphalt
	Brown, moist, very stiff silt, trace mica, trace fine sand (ML)			I	7-11-12	2	18"	No groundwater encountered while drilling
			5.0					
				I/D	5-7-9	3	18"	Caved in at 14.5' at Completion
		7.5						
	Brown to olive, moist, medium dense to dense, micaceous silty sand, trace rock fragments (SM)			D	5-6-8	4	14"	
			10.0					
				D	6-7-7	5	12"	Backfilled at completion
			15.0					
				D	12-14-18	6	16"	
			20.0					

SAMPLER TYPE

DRIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
HYDRAULIC PRESSURE SHELVY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
 Location Silver Spring, Maryland
 Date Started 11-18-99
 Hammer Wt. 140 Lbs.
 Hammer Drop 30 Inches
 Pipe Size 2.0 Inches OD

SAMPLER

Hole Diameter 4"
 Rock Core Dia -
 Boring Method HSA

Boring Number B-5
 Job # 99424A

Foreman Lamont Smith
 Inspector -
 Complete 11-18-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown to olive, moist, medium dense to dense, micaceous silty sand, trace rock fragments (SM)			D	10-14-27	7	14"	
			25.0					
		26.5		D	7-8-15	8	13"	
	Bottom of Test Hole at 26.5'							
			30.0					
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
 OTHERWISE NOTED.
 PT. PRESSED SHELBY TUBE
 CONTINUOUS FLIGHT AUGER
 ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
 I-INTACT
 U-UNDISTURBED
 L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
 AFTER FT.
 AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
 CFA-CONT. FLIGHT AUGERS
 DC-DRIVING CASING
 MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-6
Job # 99424A

Date Started	Hammer Wt.	<u>140</u> Lbs.	Hole Diameter	<u>8"</u>	Foreman	<u>Palmer Stephens</u>
	Hammer Drop	<u>30</u> Inches	Rock Core Dia	<u>-</u>	Inspector	<u></u>
	Pipe Size	<u>2.0</u> Inches OD	Boring Method	<u>HSA</u>	Complete	<u>12-15-99</u>

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, medium dense to very dense, micaceous silty sand, trace rock fragments (SM)			D	8-7-11	1	15"	8" Asphalt
				D	6-9-16	2	16"	No groundwater encountered while drilling
		5.0						
				D	7-10-12	3	16"	Caved in at 18.0' at Completion
				D	12-11-13	4	15"	
			10.0					
				D	15-22-30	5	18"	Backfilled at completion and patched
			15.0					
				D	9-10-16	6	16"	
		19.5						
			20.0					

SAMPLER TYPE
☐ RIVEN SPLIT SPOON UNLESS OTHERWISE NOTED.
☐ T-PRESSED SHELBY TUBE
☐ CONTINUOUS FLIGHT AUGER
☐ ROCK CORE

SAMPLE CONDITIONS
D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH
AT COMPLETION Dry FT.
AFTER FT.
AFTER FT.

BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-6
Job # 99424A

SAMPLER	Hammer Wt.	<u>140</u>	Lbs.	Hole Diameter	<u>8"</u>	Foreman	<u>Palmer Stephens</u>
	Hammer Drop	<u>30</u>	Inches	Rock Core Dia	<u>-</u>	Inspector	
	Pipe Size	<u>2.0</u>	Inches OD	Boring Method	<u>HSA</u>	Complete	<u>12-15-99</u>

Date Started 12-15-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown, moist, very dense, micaceous silty sand with rock fragments (SM)			D	16-42-51/2"	7	14"	
	Decomposed Rock							
		25'-1"	25.0	L	51/1"	8	No Rec	
	Bottom of Test Hole at 25'-1"							
			30.0					
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
 OTHERWISE NOTED.
 PT-PRESSED SHELBY TUBE
 CONTINUOUS FLIGHT AUGER
 ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
 I-INTACT
 U-UNDISTURBED
 L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
 AFTER FT.
 AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
 CFA-CONT. FLIGHT AUGERS
 DC-DRIVING CASING
 MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-7
Job # 99424A

Sampler
Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD
Hole Diameter 8"
Rock Core Dia -
Boring Method HSA
Foreman Palmer Stephens
Inspector -
Complete 12-15-99
Date Started 12-15-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Orange Brown to Brown/Gray, moist to very moist, medium dense to very dense, micaceous silty sand with rock fragments (SM)			D	15-10-9	1	14"	4 1/2" Asphalt 8" Gravel
				D	7-9-12	2	15"	Groundwater encountered at 20.0' while drilling
		5.0		D	13-11-11	3	12"	Caved in at 17.5' at Completion
				D	12-20-23	4	14"	Bag sample taken from 2.0' to 7.5'
		10.0		D	10-15-16	5	18"	Augered very hard from 24' to 25'
		15.0		D	8-11-15	6	18"	Backfilled at completion and patched
			20.0					

SAMPLER TYPE

DRIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PRESSURE SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-7
Job # 99424A

Sampler
Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD
Hole Diameter 8"
Rock Core Dia -
Boring Method HSA
Foreman Palmer Stephens
Inspector -
Complete 12-15-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Orange Brown to Brown/Gray, moist to very moist, medium dense to very dense, micaceous silty sand with rock fragments (SM)			D	4-7-9	7	15"	
		25.0	25.0					
	Bottom of Test Hole at 25.0'			L	51/0.0	8	No Rec	
			30.0					
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT. COMPRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
C-ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-8
Job # 99424A

Sampler
Date Started 12-15-99
Elev. _____
Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD
Hole Diameter 8"
Rock Core Dia -
Boring Method HSA
Foreman Palmer Stephens
Inspector _____
Complete 12-15-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					4" Asphalt
	Orange Brown, moist, very stiff, micaceous fine sandy silt (ML)			D	16-13-13	1	14"	9" Gravel
				D	8-10-15	2	14"	Groundwater encountered at 19.0' while drilling
		4.5						
			5.0					
	Brown, moist, medium dense, micaceous silty sand, trace rock fragments (SM)			D	10-11-15	3	14"	Caved in at 20.5' at Completion
				D	8-12-13	4	12"	Augered very hard from 22.5' to 25.0'
		10.0	10.0					
				D	30-51/4"	5	8"	
	Brown/Gray, moist to very moist, very dense, micaceous silty sand with rock fragments (SM)							
	Decomposed Rock							
			15.0					
				D	18-30-51/5"	6	15"	
			20.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
C-ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 17.0' FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-8
Job # 99424A

at n _____
JL. Elev. _____
ate Started 12-15-99

SAMPLER

Hammer Wt. 140 Lbs.
Hammer Drop 30 Inches
Pipe Size 2.0 Inches OD

Hole Diameter 8"
Rock Core Dia -
Boring Method HSA

Foreman Palmer Stephens
Inspector _____
Complete 12-15-99

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown/Gray, moist to very moist, very dense, micaceous silty sand with rock fragments (SM)			D	13-20-51/5"	7	14"	
	Decomposed Rock							
		25.0	25.0					
	Bottom of Test Hole at 25.0'			L	51/0"	8	No Rec	
			30.0					
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
C-ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 17.0' FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-9
Job # 99424A

Elev. Date Started	Hammer Wt.	<u>140</u>	Lbs.	Hole Diameter	<u>8"</u>	Foreman	<u>Palmer Stephens</u>
	Hammer Drop	<u>30</u>	Inches	Rock Core Dia	<u>-</u>	Inspector	
	Pipe Size	<u>2.0</u>	Inches OD	Boring Method	<u>HSA</u>	Complete	<u>12-13-99</u>

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown/Gray, moist to wet, very dense, micaceous silty sand with rock fragments (SM)			D	30-51/4"	7	10"	
	Decomposed Rock							
			25.0					
				L	51/2"	8	No Rec	
		28.0			51/0"	9	No Rec	
	Auger and Spoon Refusal at 28.0'							
			30.0					
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
THERWISE NOTED.
PT-PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 18'-2" FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-10
Job # 99424A

Elev. Rate Started	Hammer Wt.	<u>140</u>	Lbs.	Hole Diameter	<u>8"</u>	Foreman	<u>Palmer Stephens</u>
	Hammer Drop	<u>30</u>	Inches	Rock Core Dia	<u>-</u>	Inspector	
	Pipe Size	<u>2.0</u>	Inches OD	Boring Method	<u>HSA</u>	Complete	<u>12-16-89</u>

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Gray to black, moist, medium dense silty sand with gravel and rock fragments (SM-GM)			D	13-10-10	1	10"	8" Asphalt
	Possible Fill	4.0		D	5-19-8	2	14"	Groundwater encountered at 15.0' while drilling
	Gray/Tan, moist, medium dense to loose, micaceous silty sand (SM)		5.0	D	6-5-6	3	15"	Caved in at 14.0' at Completion
		9.5		D	2-3-4	4	18"	
	Brown, moist, medium dense, micaceous silty sand, trace rock fragments		10.0	D	7-11-12	5	16"	Backfilled at completion and patched
			15.0	D	7-15-20	6	16"	
	Brown/Gray, moist to wet, very dense, micaceous silty sand with rock fragments (SM)	17.5						
	Decomposed Rock		20.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PT. PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
C-ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 9.0' FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-9
Job # 99424A

Date	m	Elev.	Date Started	Hammer Wt.	<u>140</u>	Lbs.	Hole Diameter	<u>8"</u>	Foreman	<u>Palmer Stephens</u>
				Hammer Drop	<u>30</u>	Inches	Rock Core Dia	<u>-</u>	Inspector	<u>-</u>
				Pipe Size	<u>2.0</u>	Inches OD	Boring Method	<u>HSA</u>	Complete	<u>12-13-99</u>

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					8" Asphalt
	Brown/Gray, moist, medium dense micaceous silty sand (SM)			D	3-5-8	1	12"	Groundwater encountered at 22.0' while drilling
				D	5-5-7	2	16"	Caved in at 22'-2' at Completion
		5.0		D	6-8-11	3	15"	
				D	5-8-11	4	16"	Backfilled at completion and patched
		10.0		D	6-11-10	5	14"	
		15.0		D	3-4-7	6	18"	
		19.5	20.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
P.T.-PRESSED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 18'-2" FT.
AFTER _____ FT.
AFTER _____ FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

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RECORD OF SOIL EXPLORATION

Project Name Thayer Avenue
Location Silver Spring, Maryland

Boring Number B-10
Job # 99424A

Date Started <u>12-16-99</u>	Hammer Wt. <u>140</u> Lbs.	SAMPLER	Hole Diameter <u>8"</u>	Foreman <u>Palmer Stephens</u>
	Hammer Drop <u>30</u> Inches		Rock Core Dia <u>-</u>	Inspector <u></u>
	Pipe Size <u>2.0</u> Inches OD		Boring Method <u>HSA</u>	Complete <u>12-16-99</u>

ELEV.	SOIL DESCRIPTION <small>Color, Moisture, Density, Size, Proportion</small>	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		20.0					
	Brown/Gray, moist to wet, very dense, micaceous silty sand with rock fragments (SM) Decomposed Rock			D	16-38-51/3"	7	14"	
			25.0					
				D	51/2"	8	2"	
			30.0					
				L	51/1"	9	No Rec	
		32.5			51/0"	10	No Rec	
	Auger and Spoon Refusal at 32.5'							
			35.0					
			40.0					

SAMPLER TYPE

RIVEN SPLIT SPOON UNLESS
OTHERWISE NOTED.
PRESSURED SHELBY TUBE
CONTINUOUS FLIGHT AUGER
C-ROCK CORE

SAMPLE CONDITIONS

D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH

AT COMPLETION 9.0' FT.
AFTER FT.
AFTER FT.

BORING METHOD

HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.5	57.7	41.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1.5 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	99.5		
#10	98.6		
#40	88.1		
#100	54.7		
#200	41.8		

* (no specification provided)

Sample No.: 1
Location: B-2, S-3

Source of Sample:

Date: 12/29/1999
Elev./Depth: 5.0-6.5

HILLIS-CARNES
ENGINEERING ASSOCIATES, INC.

Client:
Project: Thayer Avenue Site

Project No: 99424A

Plate

Soil Description

Yellow brown micaceous Silty sand

Atterberg Limits

PL= 29

LL= 48

PI= 19

Coefficients

D₈₅= 0.389

D₆₀= 0.183

D₅₀= 0.121

D₃₀=

D₁₅=

D₁₀=

C_u=

C_c=

Classification

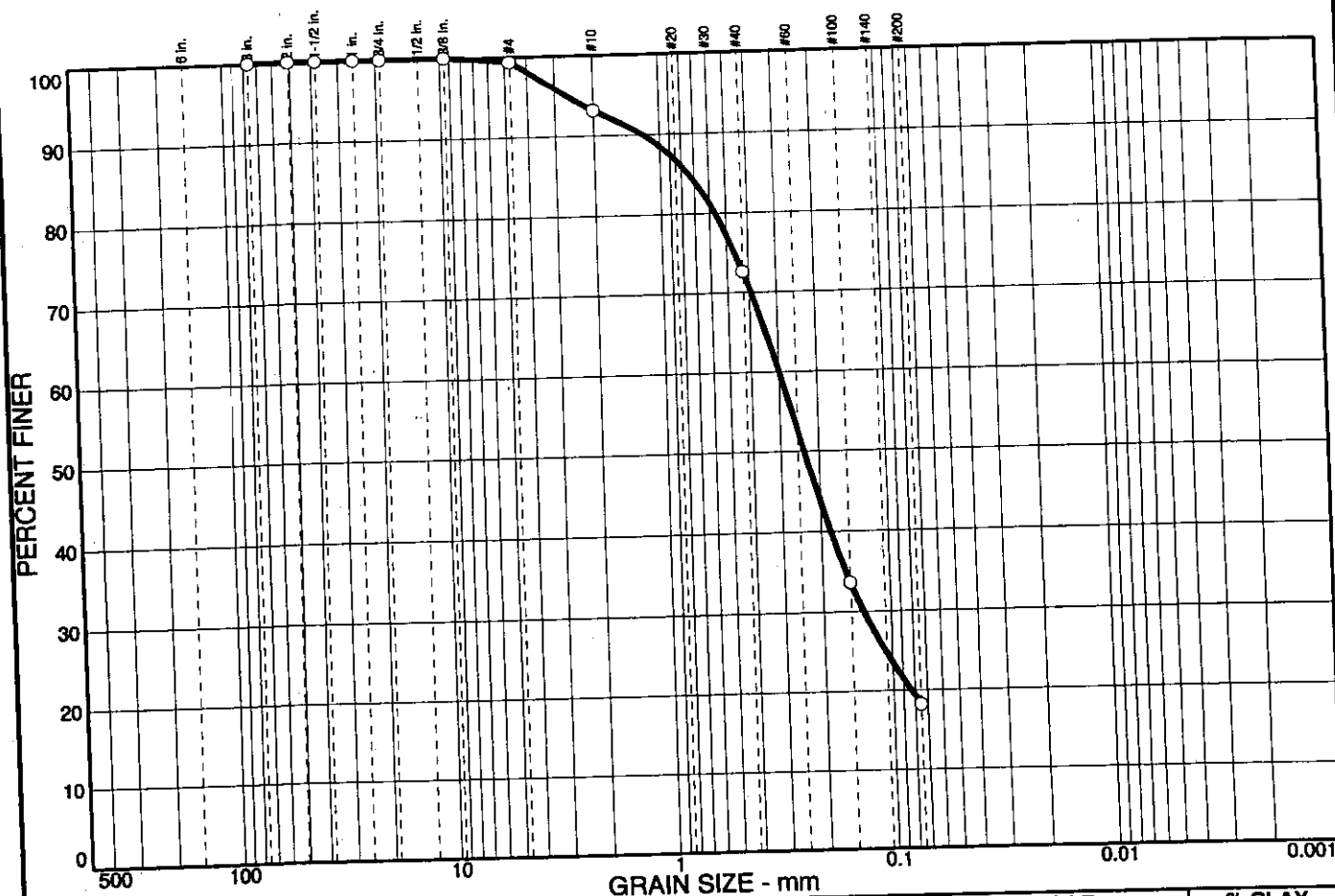
USCS= SM

AASHTO= A-7-6(4)

Remarks

Moisture Content: 25.9%

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.7	81.1	18.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100.0		
2 in.	100.0		
1.5 in.	100.0		
1 in.	100.0		
3/4 in.	100.0		
3/8 in.	100.0		
#4	99.3		
#10	93.1		
#40	72.6		
#100	33.6		
#200	18.2		

* (no specification provided)

Sample No.: 2
Location: B-5, S-7

Source of Sample:

Date: 12/29/1999
Elev./Depth: 20-21.5

HILLIS-CARNES
ENGINEERING ASSOCIATES, INC.

Client:
Project: Thayer Avenue Site
Project No: 99424A

Plate

Soil Description

Orange brown Silty sand

Atterberg Limits

PL= NP

LL= NP

PI= NP

Coefficients

D₈₅= 0.743

D₆₀= 0.300

D₅₀= 0.234

D₃₀= 0.132

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= SM

AASHTO= A-2-4(0)

Remarks

Moisture Content: 17.7%



Appendix C

Historic Data College Park Area

Addition & Alterations # 2

STUDENT UNION BUILDING

UNIVERSITY OF MARYLAND

WALTON / MADDEN

ARCHITECTS

J.L. FAISANT / ASSOCIATES

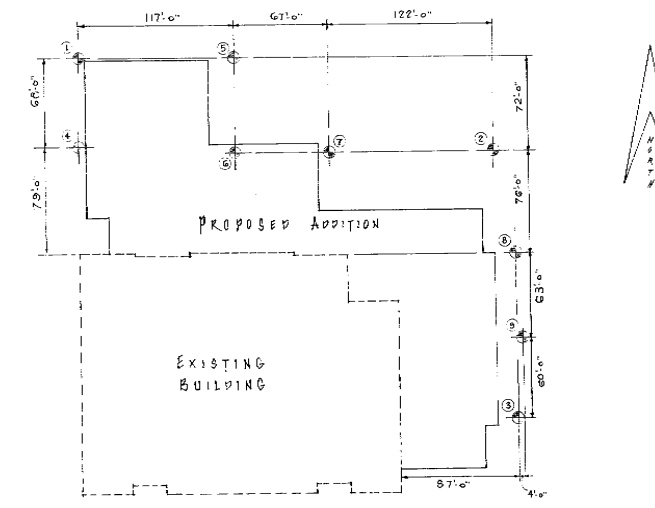
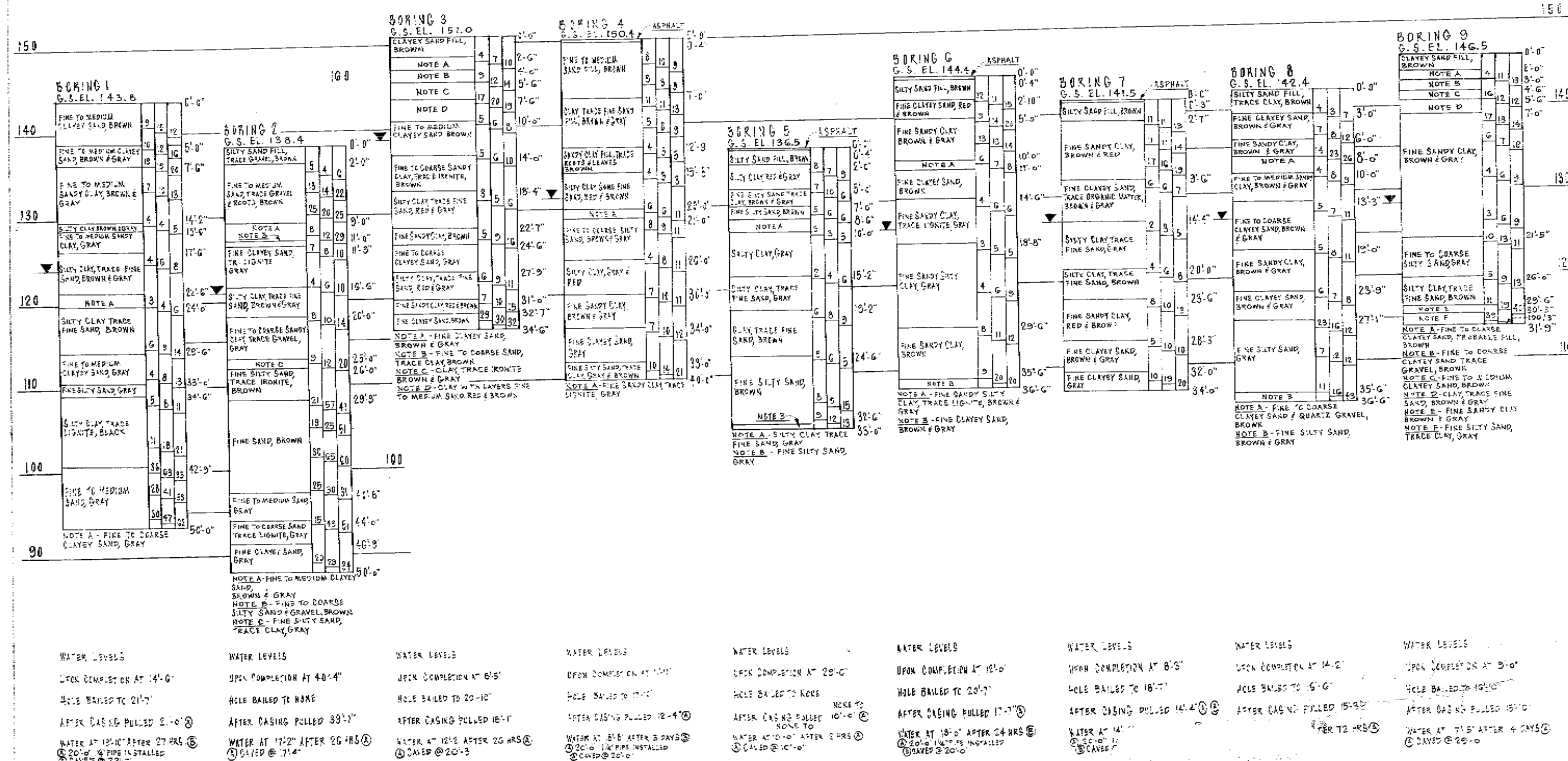
STRUCTURAL ENG.

H.W. REDMILE ASSOCIATES

MECHANICAL ENG.

SUPPLEMENTARY DRAWINGS

1. #102, #103
2. #104
3. #105, #106, #107
4. #108, #109
5. #110, #112
6. #201
7. #201, #202, #203, #204, #205
8. #301, #304, #501, #501^{1/2}, #502, #503^{1/2}, #505^{1/2}, #505^{3/4}
9. #501^{1/2}, #501^{3/4}, #501^{1/2}, #501^{3/4}
10. #503, #501^{1/2}
11. #504
12. LIGHTING PLANS: E1 SHOCK DRG., E-2 DINING ROOM
13. ATTIC REMODELING - ARCHITECTURAL
14. ATTIC REMODELING - H-1, E-1
15. RENOVATION PHASE 4 - PART B 1 of 2
16. RENOVATION PHASE 4 - PART B 2 of 2



TEST BORING LOCATIONS

TEST BORING DATA

1. PROVIDE MEMBRANE WATERPROOFING BETWEEN EXISTING AND PROPOSED BASEMENT WALLS.
2. PROVIDE METAL STRIPS AT ALL CORNERS IN BASEMENT WALLS.
3. PROVIDE TWO (2) COURSES OF 2" X 4" WALL TIES OVER ALL INTERIOR CORNERS TO EXTEND 2' BEYOND CORNERS (EACH SIDE).
4. ANY AREA NOT CLEARLY DEFINED OR INDICATED IN FINISH SCHEDULES SHALL BE FINISHED IN THE SAME MATERIALS AS AREAS OF SIMILAR USE.
5. PROVIDE DAMPPROOFING COURSE AT FOOTER AND THREE (3) COURSES ABOVE FOOTER FOR ALL EXTERIOR WALLS.
6. PROVIDE SUPPLEMENTARY FRAMING FOR ALL LIGHT FIXTURES, OPERABLE WALLS, BULKHEADS, SMOKE STOPS, ETC.
7. EXTEND ALL INTERIOR WALLS AND PARTITIONS OF MASONRY OR CONCRETE TO UNDERSIDE OF ROOF DECK, UNLESS SPECIFICALLY NOTED OTHERWISE.
8. NO ELECTRICAL LIGHT FIXTURES SHALL BE SUPPORTED BY THE CEILING CONSTRUCTION.

GENERAL NOTES

9. PROVIDE ONE (1) COURSE OF 2" X 4" WALL TIES OVER ALL INTERIOR CORNERS TO EXTEND 2' BEYOND CORNERS (EACH SIDE).
10. PROVIDE MEMBRANE WATERPROOFING BETWEEN EXISTING AND PROPOSED BASEMENT WALLS.
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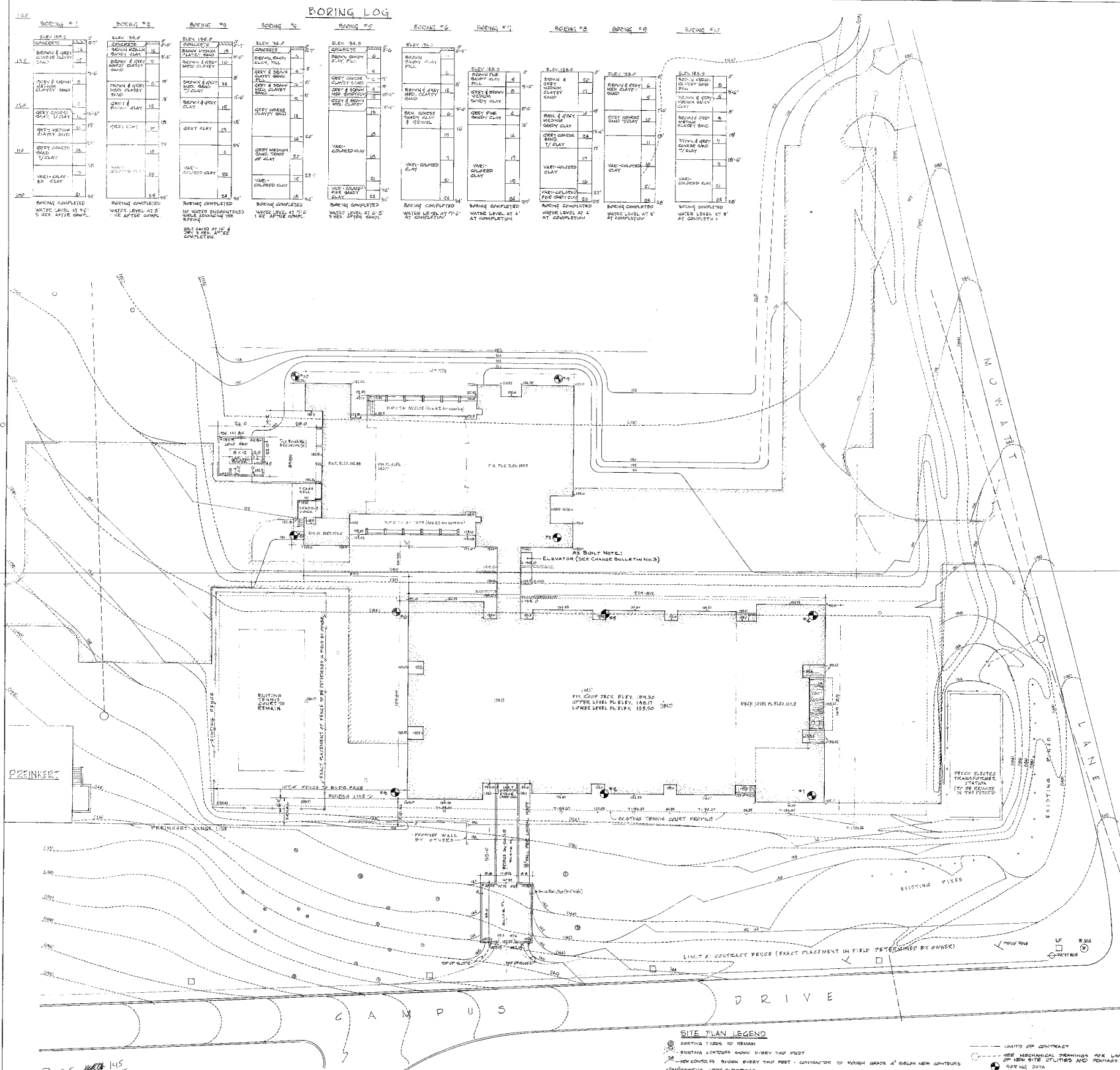
GENERAL NOTES

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GENERAL NOTES

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44. NO ELECTRICAL LIGHT FIXTURES SHALL BE SUPPORTED BY THE CEILING CONSTRUCTION.

ARCHITECTURAL		MECHANICAL	
1-51	DOOR SCHEDULES - FINISH DATA	1-51	DOOR SCHEDULES - FINISH DATA
2-51	TEST BORING DATA	2-51	TEST BORING DATA
3-51	SITE PLAN	3-51	SITE PLAN
4-51	3RD-BASEMENT FLOOR PLAN - NORTH	4-51	3RD-BASEMENT FLOOR PLAN - NORTH
5-51	3RD-BASEMENT FLOOR PLAN - SOUTH	5-51	3RD-BASEMENT FLOOR PLAN - SOUTH
6-51	BASEMENT FLOOR PLAN - NORTH	6-51	BASEMENT FLOOR PLAN - NORTH
7-51	BASEMENT FLOOR PLAN - SOUTH	7-51	BASEMENT FLOOR PLAN - SOUTH
8-51	FIRST FLOOR PLAN - NORTH	8-51	FIRST FLOOR PLAN - NORTH
9-51	FIRST FLOOR PLAN - SOUTH	9-51	FIRST FLOOR PLAN - SOUTH
10-51	SECOND FLOOR PLAN - NORTH	10-51	SECOND FLOOR PLAN - NORTH
11-51	SECOND FLOOR PLAN - SOUTH	11-51	SECOND FLOOR PLAN - SOUTH
12-51	ROOF PLAN - WINDOW SCHEDULES	12-51	ROOF PLAN - WINDOW SCHEDULES
13-51	ELEVATIONS	13-51	ELEVATIONS
14-51	ELEVATIONS / SECTIONS	14-51	ELEVATIONS / SECTIONS
15-51	ELEVATIONS / SECTIONS	15-51	ELEVATIONS / SECTIONS
16-51	ELEVATIONS / SECTIONS	16-51	ELEVATIONS / SECTIONS
17-51	SCHEDULES OF INTERIOR FINISHES / ARCHITECTURAL	17-51	SCHEDULES OF INTERIOR FINISHES / ARCHITECTURAL
18-51	SCHEDULES OF INTERIOR FINISHES / ARCHITECTURAL	18-51	SCHEDULES OF INTERIOR FINISHES / ARCHITECTURAL
19-51	SCHEDULES OF INTERIOR FINISHES / ARCHITECTURAL	19-51	SCHEDULES OF INTERIOR FINISHES / ARCHITECTURAL
20-51	OPENING SCHEDULES / ARCHITECTURAL	20-51	OPENING SCHEDULES / ARCHITECTURAL
21-51	WALL SECTIONS	21-51	WALL SECTIONS
22-51	WALL SECTIONS	22-51	WALL SECTIONS
23-51	WALL SECTIONS	23-51	WALL SECTIONS
24-51	WALL SECTIONS	24-51	WALL SECTIONS
25-51	WALL SECTIONS	25-51	WALL SECTIONS
26-51	WALL SECTIONS	26-51	WALL SECTIONS
27-51	DETAILS OF STAIRS #1, #2	27-51	DETAILS OF STAIRS #1, #2
28-51	DETAILS OF LOBBY / STAIRS #3, #4	28-51	DETAILS OF LOBBY / STAIRS #3, #4
29-51	DETAILS OF LOBBY / STAIRS #5, #6	29-51	DETAILS OF LOBBY / STAIRS #5, #6
30-51	DETAILS OF STAIRS #7, #8	30-51	DETAILS OF STAIRS #7, #8
31-51	DETAILS OF STAIRS #9, #10	31-51	DETAILS OF STAIRS #9, #10
32-51	DETAILS OF STAIRS #11, #12	32-51	DETAILS OF STAIRS #11, #12
33-51	DETAILS OF STAIRS #13, #14	33-51	DETAILS OF STAIRS #13, #14
34-51	DETAILS OF STAIRS #15, #16	34-51	DETAILS OF STAIRS #15, #16
35-51	DETAILS OF STAIRS #17, #18	35-51	DETAILS OF STAIRS #17, #18
36-51	DETAILS OF STAIRS #19, #20	36-51	DETAILS OF STAIRS #19, #20
37-51	DETAILS OF STAIRS #21, #22	37-51	DETAILS OF STAIRS #21, #22
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39-51	DETAILS OF STAIRS #25, #26	39-51	DETAILS OF STAIRS #25, #26
40-51	DETAILS OF STAIRS #27, #28	40-51	DETAILS OF STAIRS #27, #28
41-51	DETAILS OF STAIRS #29, #30	41-51	DETAILS OF STAIRS #29, #30
42-51	DETAILS OF STAIRS #31, #32	42-51	DETAILS OF STAIRS #31, #32
43-51	DETAILS OF STAIRS #33, #34	43-51	DETAILS OF STAIRS #33, #34
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85-51	DETAILS OF STAIRS #117, #118	85-51	DETAILS OF STAIRS #117, #118
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88-51	DETAILS OF STAIRS #123, #124	88-51	DETAILS OF STAIRS #123, #124
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91-51	DETAILS OF STAIRS #129, #130	91-51	DETAILS OF STAIRS #129, #130
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93-51	DETAILS OF STAIRS #133, #134	93-51	DETAILS OF STAIRS #133, #134
94-51	DETAILS OF STAIRS #135, #136	94-51	DETAILS OF STAIRS #135, #136
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98-51	DETAILS OF STAIRS #143, #144	98-51	DETAILS OF STAIRS #143, #144
99-51	DETAILS OF STAIRS #145, #146	99-51	DETAILS OF STAIRS #145, #146
100-51	DETAILS OF STAIRS #147, #148	100-51	DETAILS OF STAIRS #147, #148
101-51	DETAILS OF STAIRS #149, #150	101-51	DETAILS OF STAIRS #149, #150
102-51	DETAILS OF STAIRS #151, #152	102-51	DETAILS OF STAIRS #151, #152
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107-51	DETAILS OF STAIRS #161, #162	107-51	DETAILS OF STAIRS #161, #162
108-51	DETAILS OF STAIRS #163, #164	108-51	DETAILS OF STAIRS #163, #164
109-51	DETAILS OF STAIRS #165, #166	109-51	DETAILS OF STAIRS #165, #166
110-51	DETAILS OF STAIRS #167, #168	110-51	DETAILS OF STAIRS #167, #168
111-51	DETAILS OF STAIRS #169, #170	111-51	DETAILS OF STAIRS #169, #170
112-51	DETAILS OF STAIRS #171, #172	112-51	DETAILS OF STAIRS #171, #172
113-51	DETAILS OF STAIRS #173, #174	113-51	DETAILS OF STAIRS #173, #174
114-51	DETAILS OF STAIRS #175, #176	114-51	DETAILS OF STAIRS #175, #176
115-51	DETAILS OF STAIRS #177, #178	115-51	DETAILS OF STAIRS #177, #178
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118-51	DETAILS OF STAIRS #183, #184	118-51	DETAILS OF STAIRS #183, #184
119-51	DETAILS OF STAIRS #185, #186	119-51	DETAILS OF STAIRS #185, #186
120-51	DETAILS OF STAIRS #187, #188	120-51	DETAILS OF STAIRS #187, #188
121-51	DETAILS OF STAIRS #189, #190	121-51	DETAILS OF STAIRS #189, #190
122-51	DETAILS OF STAIRS #191, #192	122-51	DETAILS OF STAIRS #191, #192
123-51	DETAILS OF STAIRS #193, #194	123-51	DETAILS OF STAIRS #193, #194
124-51	DETAILS OF STAIRS #195, #196	124-51	DETAILS OF STAIRS #195, #196
125-51	DETAILS OF STAIRS #197, #198	125-51	DETAILS OF STAIRS #197, #198
126-51	DETAILS OF STAIRS #199, #200	126-51	DETAILS OF STAIRS #199, #200
127-51	DETAILS OF STAIRS #201, #202	127-51	DETAILS OF STAIRS #201, #202
128-51	DETAILS OF STAIRS #203, #204	128-51	DETAILS OF STAIRS #203, #204
129-51	DETAILS OF STAIRS #205, #206	129-51	DETAILS OF STAIRS #205, #206
130-51	DETAILS OF STAIRS #207, #208	130-51	DETAILS OF STAIRS #207, #208
131-51	DETAILS OF STAIRS #209, #210	131-51	DETAILS OF STAIRS #209, #210
132-51	DETAILS OF STAIRS #211, #212	132-51	DETAILS OF STAIRS #211, #212
133-51	DETAILS OF STAIRS #213, #214	133-51	DETAILS OF STAIRS #213, #214
134-51	DETAILS OF STAIRS #215, #216	134-51	DETAILS OF STAIRS #215, #216
135-51	DETAILS OF STAIRS #217, #218	135-51	DETAILS OF STAIRS #217, #218
136-51	DETAILS OF STAIRS #219, #220	136-51	DETAILS OF STAIRS #219, #220
137-51	DETAILS OF STAIRS #221, #222	137-51	DETAILS OF STAIRS #221, #222
138-51	DETAILS OF STAIRS #223, #224	138-51	DETAILS OF STAIRS #223, #224
139-51	DETAILS OF STAIRS #225, #226	139-51	DETAILS OF STAIRS #225, #226
140-51	DETAILS OF STAIRS #227, #228	140-51	DETAILS OF STAIRS #227, #228
141-51	DETAILS OF STAIRS #229, #230	141-51	DETAILS OF STAIRS #229, #230
142-51	DETAILS OF STAIRS #231, #232	142-51	DETAILS OF STAIRS #231, #232
143-51	DETAILS OF STAIRS #233, #234	143-51	DETAILS OF STAIRS #233, #234
144-51	DETAILS OF STAIRS #235, #236	144-51	DETAILS OF STAIRS #235, #236
145-51	DETAILS OF STAIRS #237, #238	145-51	DETAILS OF STAIRS #237, #238
146-51	DETAILS OF STAIRS #239, #240	146-51	DETAILS OF STAIRS #239, #240
147-51	DETAILS OF STAIRS #241, #242	147-51	DETAILS OF STAIRS #241, #242
148-51	DETAILS OF STAIRS #243, #244	148-51	DETAILS OF STAIRS #243, #244
149-51	DETAILS OF STAIRS #245, #246	149-51	DETAILS OF STAIRS #245, #246
150-51	DETAILS OF STAIRS #247, #248	150-51	DETAILS OF STAIRS #247, #248
151-51	DETAILS OF STAIRS #249, #250	151-51	DETAILS OF STAIRS #249, #250



LOWER LEVEL INSTRUCTIONAL BLDG.					
SPACE DESIGNATION	FLOOR	WALLS	CEILING	DOORS	REMARKS
STAIR 1	1st	Concrete	Concrete	Steel	
STAIR 2	1st	Concrete	Concrete	Steel	
STAIR 3	1st	Concrete	Concrete	Steel	
STAIR 4	1st	Concrete	Concrete	Steel	
STAIR 5	1st	Concrete	Concrete	Steel	
STAIR 6	1st	Concrete	Concrete	Steel	
STAIR 7	1st	Concrete	Concrete	Steel	
STAIR 8	1st	Concrete	Concrete	Steel	
STAIR 9	1st	Concrete	Concrete	Steel	
STAIR 10	1st	Concrete	Concrete	Steel	
STAIR 11	1st	Concrete	Concrete	Steel	
STAIR 12	1st	Concrete	Concrete	Steel	

BASEMENT INSTRUCTIONAL BLDG.					
SPACE DESIGNATION	FLOOR	WALLS	CEILING	DOORS	REMARKS
STAIR 1	Basement	Concrete	Concrete	Steel	
STAIR 2	Basement	Concrete	Concrete	Steel	
STAIR 3	Basement	Concrete	Concrete	Steel	
STAIR 4	Basement	Concrete	Concrete	Steel	
STAIR 5	Basement	Concrete	Concrete	Steel	
STAIR 6	Basement	Concrete	Concrete	Steel	
STAIR 7	Basement	Concrete	Concrete	Steel	
STAIR 8	Basement	Concrete	Concrete	Steel	
STAIR 9	Basement	Concrete	Concrete	Steel	
STAIR 10	Basement	Concrete	Concrete	Steel	
STAIR 11	Basement	Concrete	Concrete	Steel	
STAIR 12	Basement	Concrete	Concrete	Steel	

LOWER LEVEL ADMINISTRATION BLDG.					
SPACE DESIGNATION	FLOOR	WALLS	CEILING	DOORS	REMARKS
STAIR 1	1st	Concrete	Concrete	Steel	
STAIR 2	1st	Concrete	Concrete	Steel	
STAIR 3	1st	Concrete	Concrete	Steel	
STAIR 4	1st	Concrete	Concrete	Steel	
STAIR 5	1st	Concrete	Concrete	Steel	
STAIR 6	1st	Concrete	Concrete	Steel	
STAIR 7	1st	Concrete	Concrete	Steel	
STAIR 8	1st	Concrete	Concrete	Steel	
STAIR 9	1st	Concrete	Concrete	Steel	
STAIR 10	1st	Concrete	Concrete	Steel	
STAIR 11	1st	Concrete	Concrete	Steel	
STAIR 12	1st	Concrete	Concrete	Steel	

UPPER LEVEL INSTRUCTIONAL BLDG.					
SPACE DESIGNATION	FLOOR	WALLS	CEILING	DOORS	REMARKS
STAIR 1	2nd	Concrete	Concrete	Steel	
STAIR 2	2nd	Concrete	Concrete	Steel	
STAIR 3	2nd	Concrete	Concrete	Steel	
STAIR 4	2nd	Concrete	Concrete	Steel	
STAIR 5	2nd	Concrete	Concrete	Steel	
STAIR 6	2nd	Concrete	Concrete	Steel	
STAIR 7	2nd	Concrete	Concrete	Steel	
STAIR 8	2nd	Concrete	Concrete	Steel	
STAIR 9	2nd	Concrete	Concrete	Steel	
STAIR 10	2nd	Concrete	Concrete	Steel	
STAIR 11	2nd	Concrete	Concrete	Steel	
STAIR 12	2nd	Concrete	Concrete	Steel	

LIBRARY MEZZANINE					
SPACE DESIGNATION	FLOOR	WALLS	CEILING	DOORS	REMARKS
STAIR 1	Mezzanine	Concrete	Concrete	Steel	
STAIR 2	Mezzanine	Concrete	Concrete	Steel	
STAIR 3	Mezzanine	Concrete	Concrete	Steel	
STAIR 4	Mezzanine	Concrete	Concrete	Steel	
STAIR 5	Mezzanine	Concrete	Concrete	Steel	
STAIR 6	Mezzanine	Concrete	Concrete	Steel	
STAIR 7	Mezzanine	Concrete	Concrete	Steel	
STAIR 8	Mezzanine	Concrete	Concrete	Steel	
STAIR 9	Mezzanine	Concrete	Concrete	Steel	
STAIR 10	Mezzanine	Concrete	Concrete	Steel	
STAIR 11	Mezzanine	Concrete	Concrete	Steel	
STAIR 12	Mezzanine	Concrete	Concrete	Steel	

UPPER LEVEL ADMINISTRATION BLDG.					
SPACE DESIGNATION	FLOOR	WALLS	CEILING	DOORS	REMARKS
STAIR 1	3rd	Concrete	Concrete	Steel	
STAIR 2	3rd	Concrete	Concrete	Steel	
STAIR 3	3rd	Concrete	Concrete	Steel	
STAIR 4	3rd	Concrete	Concrete	Steel	
STAIR 5	3rd	Concrete	Concrete	Steel	
STAIR 6	3rd	Concrete	Concrete	Steel	
STAIR 7	3rd	Concrete	Concrete	Steel	
STAIR 8	3rd	Concrete	Concrete	Steel	
STAIR 9	3rd	Concrete	Concrete	Steel	
STAIR 10	3rd	Concrete	Concrete	Steel	
STAIR 11	3rd	Concrete	Concrete	Steel	
STAIR 12	3rd	Concrete	Concrete	Steel	

MATERIALS					
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	
CONCRETE	PLAIN	FORMED	CAST	IN PLACE	

SYMBOLS					
1	DETAIL NUMBER	2	INTERIOR DOOR & HOLLOW METAL FRAME	3	INTERIOR DOOR & HOLLOW METAL FRAME
4	SECTION LETTER	5	INTERIOR DOOR & HOLLOW METAL FRAME	6	INTERIOR DOOR & HOLLOW METAL FRAME
7	SECTION LETTER	8	INTERIOR DOOR & HOLLOW METAL FRAME	9	INTERIOR DOOR & HOLLOW METAL FRAME
10	SECTION LETTER	11	INTERIOR DOOR & HOLLOW METAL FRAME	12	INTERIOR DOOR & HOLLOW METAL FRAME
13	SECTION LETTER	14	INTERIOR DOOR & HOLLOW METAL FRAME	15	INTERIOR DOOR & HOLLOW METAL FRAME
16	SECTION LETTER	17	INTERIOR DOOR & HOLLOW METAL FRAME	18	INTERIOR DOOR & HOLLOW METAL FRAME
19	SECTION LETTER	20	INTERIOR DOOR & HOLLOW METAL FRAME	21	INTERIOR DOOR & HOLLOW METAL FRAME
22	SECTION LETTER	23	INTERIOR DOOR & HOLLOW METAL FRAME	24	INTERIOR DOOR & HOLLOW METAL FRAME
25	SECTION LETTER	26	INTERIOR DOOR & HOLLOW METAL FRAME	27	INTERIOR DOOR & HOLLOW METAL FRAME
28	SECTION LETTER	29	INTERIOR DOOR & HOLLOW METAL FRAME	30	INTERIOR DOOR & HOLLOW METAL FRAME
31	SECTION LETTER	32	INTERIOR DOOR & HOLLOW METAL FRAME	33	INTERIOR DOOR & HOLLOW METAL FRAME

ABBREVIATIONS					
1	DETAIL NUMBER	2	INTERIOR DOOR & HOLLOW METAL FRAME	3	INTERIOR DOOR & HOLLOW METAL FRAME
4	SECTION LETTER	5	INTERIOR DOOR & HOLLOW METAL FRAME	6	INTERIOR DOOR & HOLLOW METAL FRAME
7	SECTION LETTER	8	INTERIOR DOOR & HOLLOW METAL FRAME	9	INTERIOR DOOR & HOLLOW METAL FRAME
10	SECTION LETTER	11	INTERIOR DOOR & HOLLOW METAL FRAME	12	INTERIOR DOOR & HOLLOW METAL FRAME
13	SECTION LETTER	14	INTERIOR DOOR & HOLLOW METAL FRAME	15	INTERIOR DOOR & HOLLOW METAL FRAME
16	SECTION LETTER	17	INTERIOR DOOR & HOLLOW METAL FRAME	18	INTERIOR DOOR & HOLLOW METAL FRAME
19	SECTION LETTER	20	INTERIOR DOOR & HOLLOW METAL FRAME	21	INTERIOR DOOR & HOLLOW METAL FRAME
22	SECTION LETTER	23	INTERIOR DOOR & HOLLOW METAL FRAME	24	INTERIOR DOOR & HOLLOW METAL FRAME
25	SECTION LETTER	26	INTERIOR DOOR & HOLLOW METAL FRAME	27	INTERIOR DOOR & HOLLOW METAL FRAME
28	SECTION LETTER	29	INTERIOR DOOR & HOLLOW METAL FRAME	30	INTERIOR DOOR & HOLLOW METAL FRAME
31	SECTION LETTER	32	INTERIOR DOOR & HOLLOW METAL FRAME	33	INTERIOR DOOR & HOLLOW METAL FRAME

BLDG 145 ARCHITECTURE

FISHER, NES, CAMPBELL & PARTNERS
ARCHITECTS BALTIMORE, MARYLAND
VAN RENSSELAER P. SKE
FISHER, NES, CAMPBELL & PARTNERS

APPROVED
[Signature]

DATE: 12/15/1972

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AS BUILT

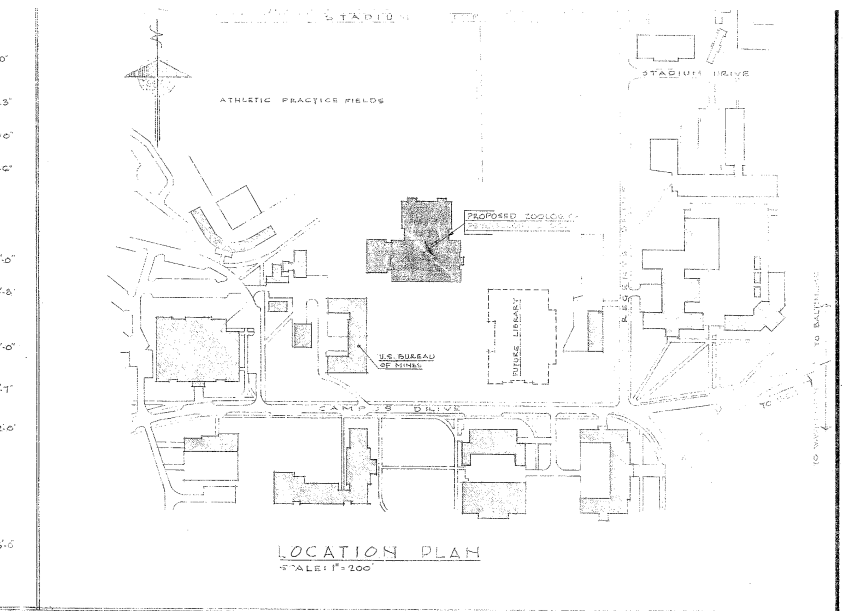
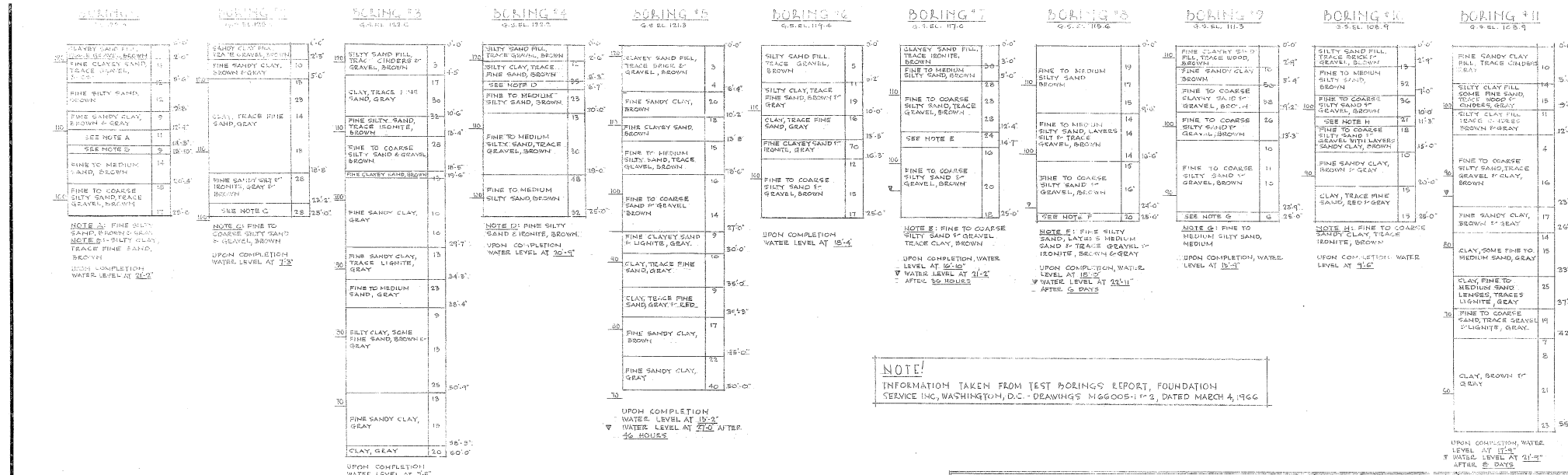
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UNIVERSITY OF MARYLAND
COLLEGE PARK, MARYLAND

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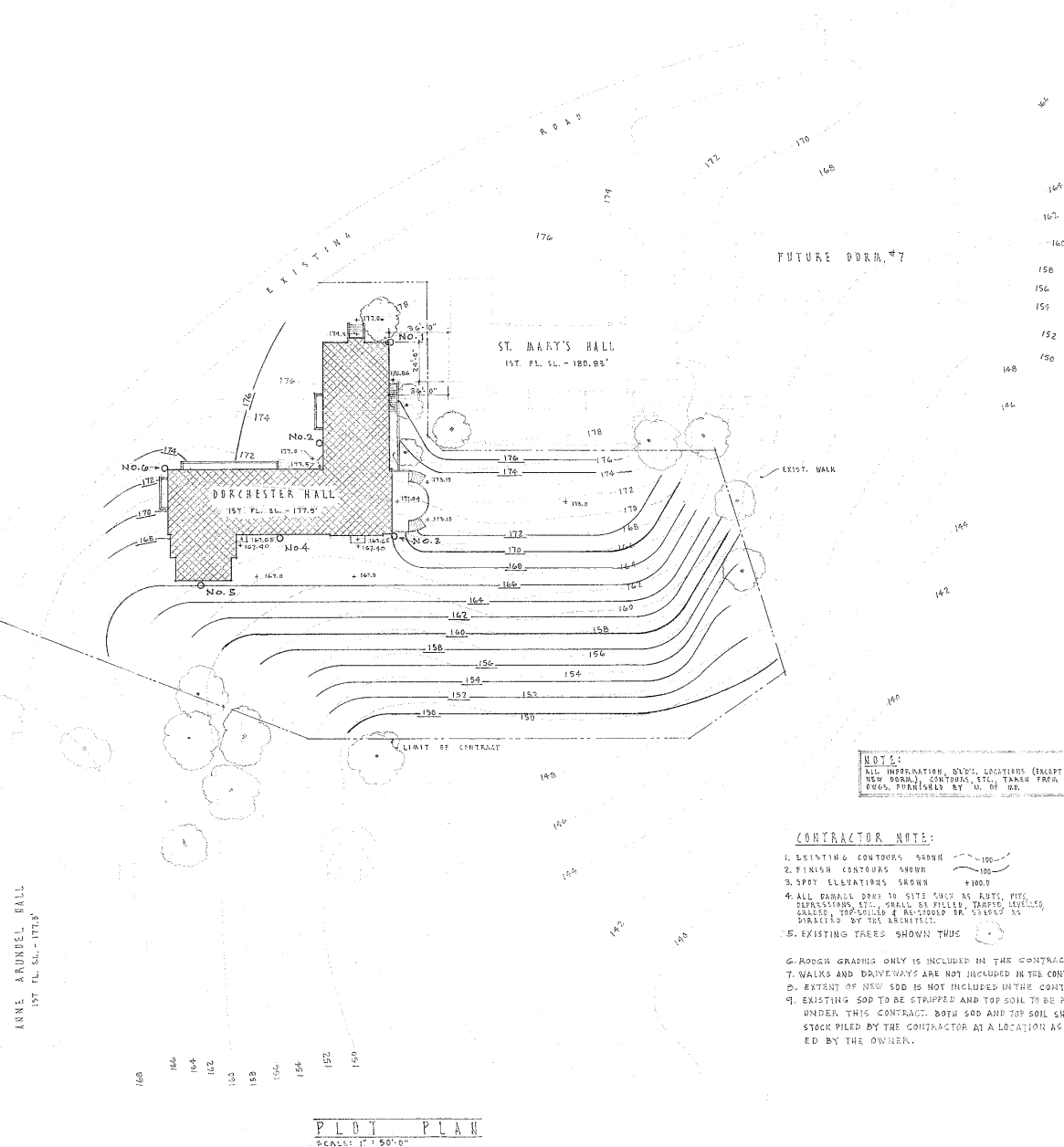
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ABBREVIATIONS		MATERIAL INDICATIONS	
ACI	ACROSTIC	BRICK	ALUM. HUN.
AD	ADJUST	CONCRETE	LEAD CURB BLOCK
AM	AMERICAN	CONCRETE BLOCK	FINISHED WOOD
AN	ANALOG	SLAG OR CLINKER BLOCK	WOOD FLOORING
AP	APPROXIMATE	TREASURY	ACOUSTIC TILE
AR	ARCHITECT	SLATE	PLYWOOD
AS	ASBESTOS	LIMESTONE	INSULATION
AT	ATMOSPHERE	MARBLE	MASONRY FILL INSULATION
AV	AVIATION	CERAMIC TILE OR SLAB	FINISHED GRADE
AW	AWAY	GRASSY FIELD	PLASTER
AX	AXIS	STEEL	EARTH
AY	AYER		METALLIC WATERPROOFING
BA	BALANCE		
BB	BALANCE		
BC	BALANCE		
BD	BALANCE		
BE	BALANCE		
BF	BALANCE		
BG	BALANCE		
BH	BALANCE		
BI	BALANCE		
BJ	BALANCE		
BK	BALANCE		
BL	BALANCE		
BM	BALANCE		
BN	BALANCE		
BO	BALANCE		
BP	BALANCE		
BQ	BALANCE		
BR	BALANCE		
BS	BALANCE		
BT	BALANCE		
BU	BALANCE		
BV	BALANCE		
BW	BALANCE		
BY	BALANCE		
BZ	BALANCE		
CA	CALCULATED		
CB	CALCULATED		
CC	CALCULATED		
CD	CALCULATED		
CE	CALCULATED		
CF	CALCULATED		
CG	CALCULATED		
CH	CALCULATED		
CI	CALCULATED		
CJ	CALCULATED		
CK	CALCULATED		
CL	CALCULATED		
CM	CALCULATED		
CN	CALCULATED		
CO	CALCULATED		
CP	CALCULATED		
CQ	CALCULATED		
CR	CALCULATED		
CS	CALCULATED		
CT	CALCULATED		
CU	CALCULATED		
CV	CALCULATED		
CW	CALCULATED		
CX	CALCULATED		
CY	CALCULATED		
CZ	CALCULATED		
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DB	DAILY		
DC	DAILY		
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D O R C H E S T E R H A L L

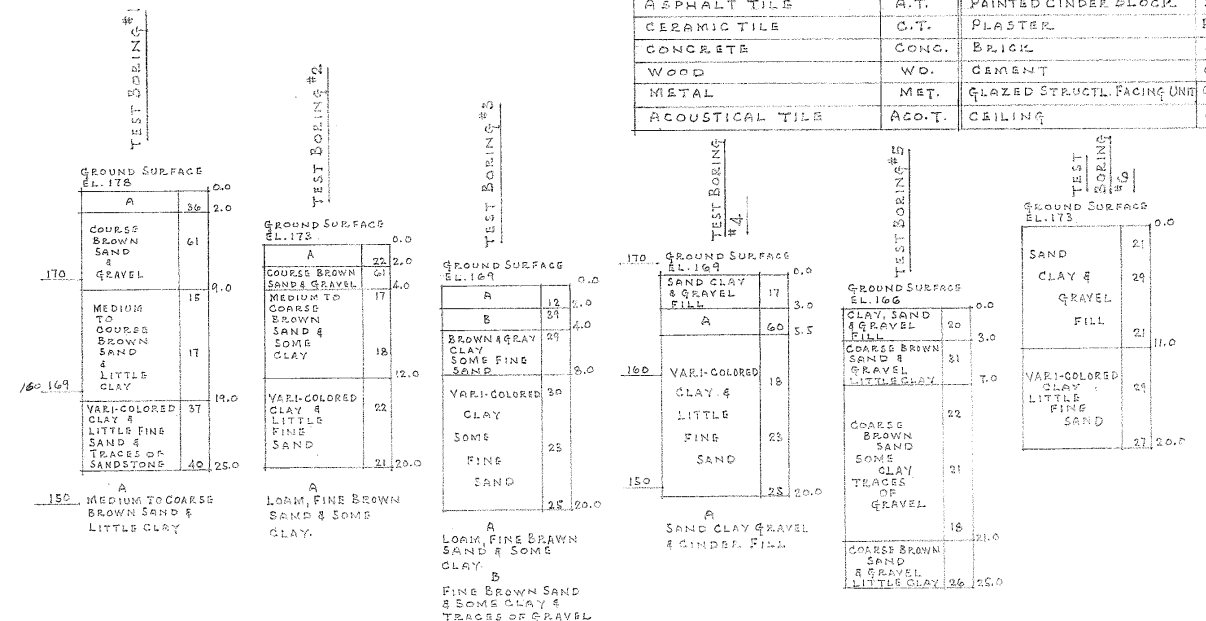
UNIVERSITY OF MARYLAND



BRICK	GYP-SUM-PLASTER
CINDER BLOCK	WOOD
CONCRETE	INSULATION
CRUSHED STONE-GRAVEL	METAL-SHEET
ROUGH WOOD	STEEL

MATERIALS LEGEND

ABBREVIATIONS			
ASPHALT TILE	A.T.	PAINTED CINDER BLOCK	P.C.B.
CERAMIC TILE	C.T.	PLASTER	PL. PLAC.
CONCRETE	CONC.	BRICK	BR.
WOOD	WO.	CEMENT	CEM.
METAL	MET.	GLAZED STRUCT. FACING UNIT	G.S.F.U.
ACOUSTICAL TILE	ACO.T.	CEILING	CLG.



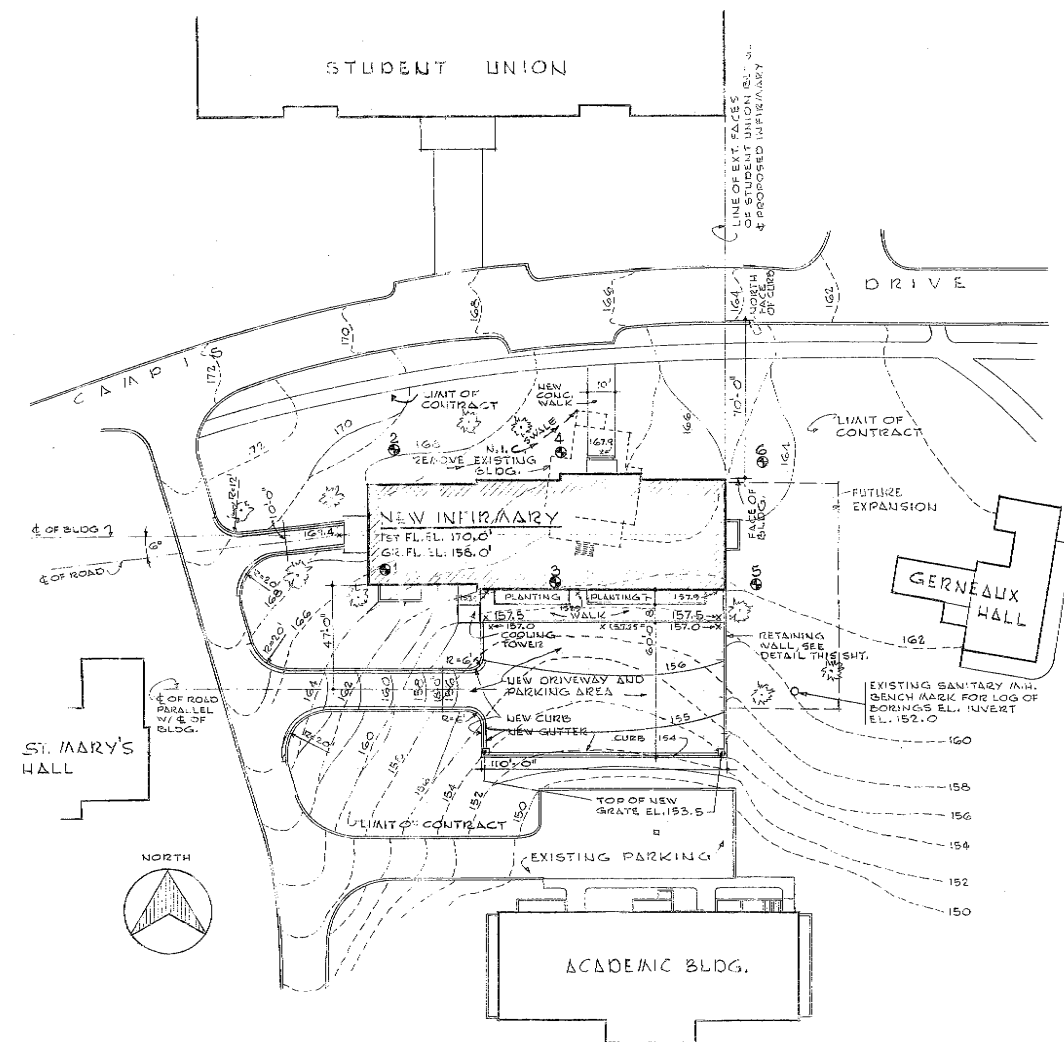
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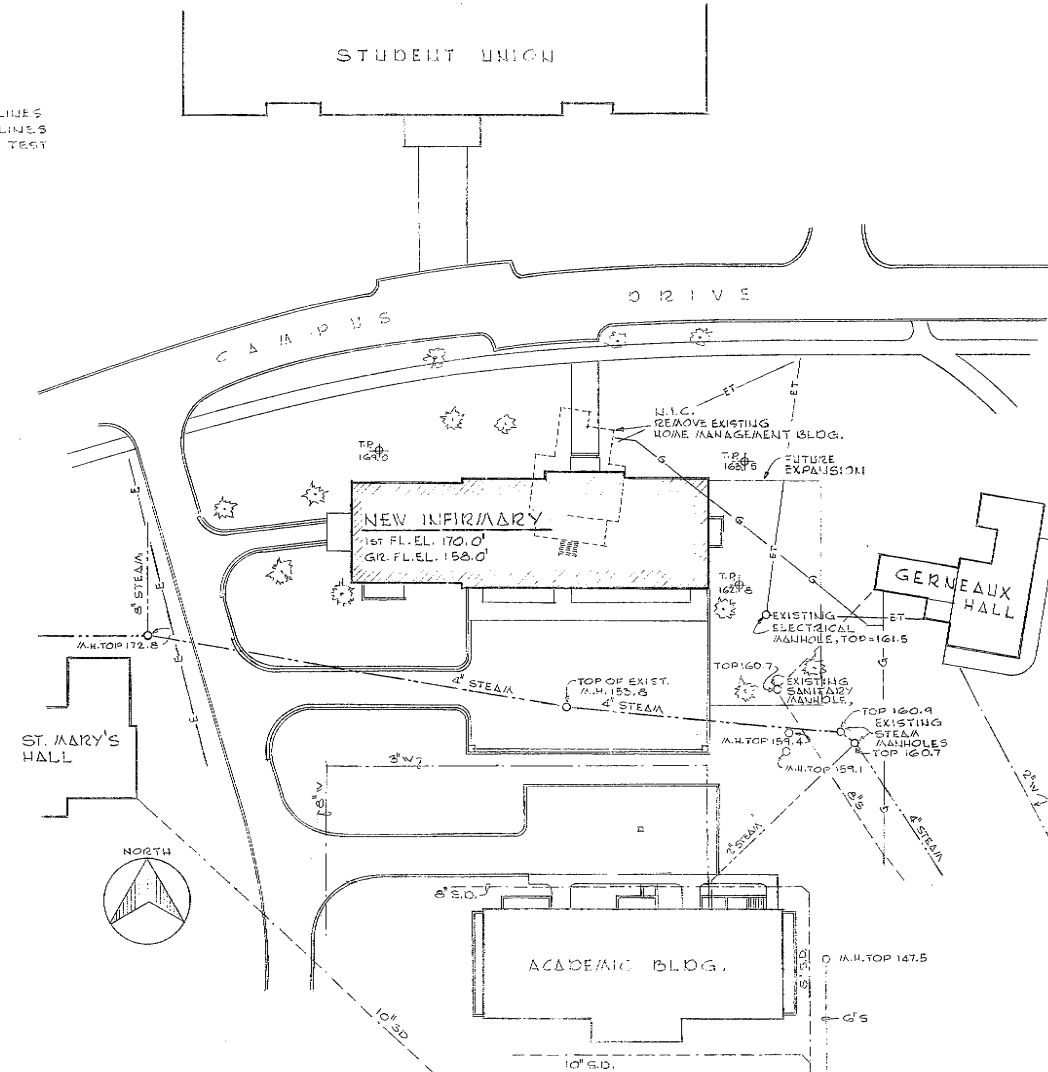
WOMENS DORMITORY
 DORCHESTER HALL
 UNIVERSITY OF MARYLAND
 COLLEGE PARK MARYLAND

APPROVED: *George D. Water*
 UNIV. OF MARYLAND
 STATE OF MARYLAND
 DEPARTMENT OF PUBLIC IMPROVEMENTS
 APPROVED Oct. 24, 1957
 PRINCIPAL ARCH.
 DIRECTOR

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 PLOT PLAN



SITE PLAN



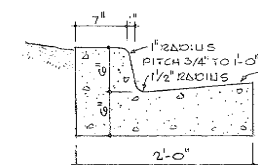
EXISTING UTILITY PLAN
SCALE 1" = 40'-0"

LOG OF BORINGS

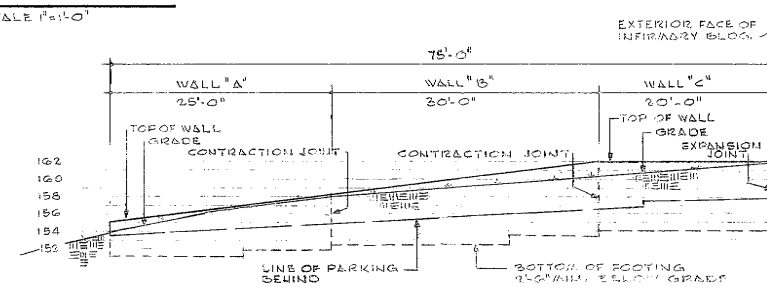
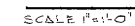
[illegible]

GENERAL NOTE:

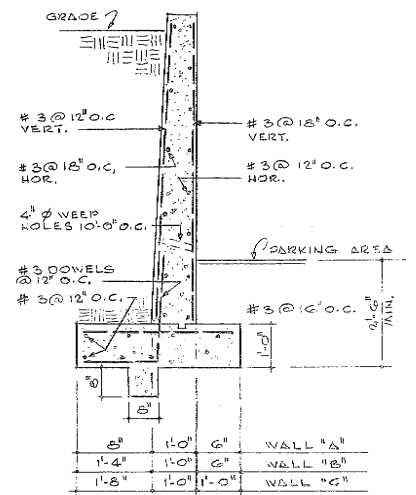
1. NUMBER IN RIGHT HAND COLUMN OF BORING LOG INDICATES BLOWS REQUIRED TO DRIVE 2 IN. O.D. 1 3/8 IN. I.D. SAMPLING SPOON ONE FOOT, USING 140 POUND HAMMER FALLING 30 INCHES.



CURB DETAIL



WALL ELEVATION
SCALE 1"=10'-0"



TYPICAL SECTION
NO SCALE

ACADEMIC BLDG

SIDEWALK DETAIL

Scale: 3/4" = 1'-0"

COMBINATION CURB & GUTTER DETAIL

Scale: 3/4" = 1'-0"

PLATFORM DETAIL

Scale: 1/8" = 1'-0"

PLAN OF PLATFORM, TYPICAL WALK & STEPS "D"

Scale: 1" = 20'-0"

TYPICAL STEP DETAIL

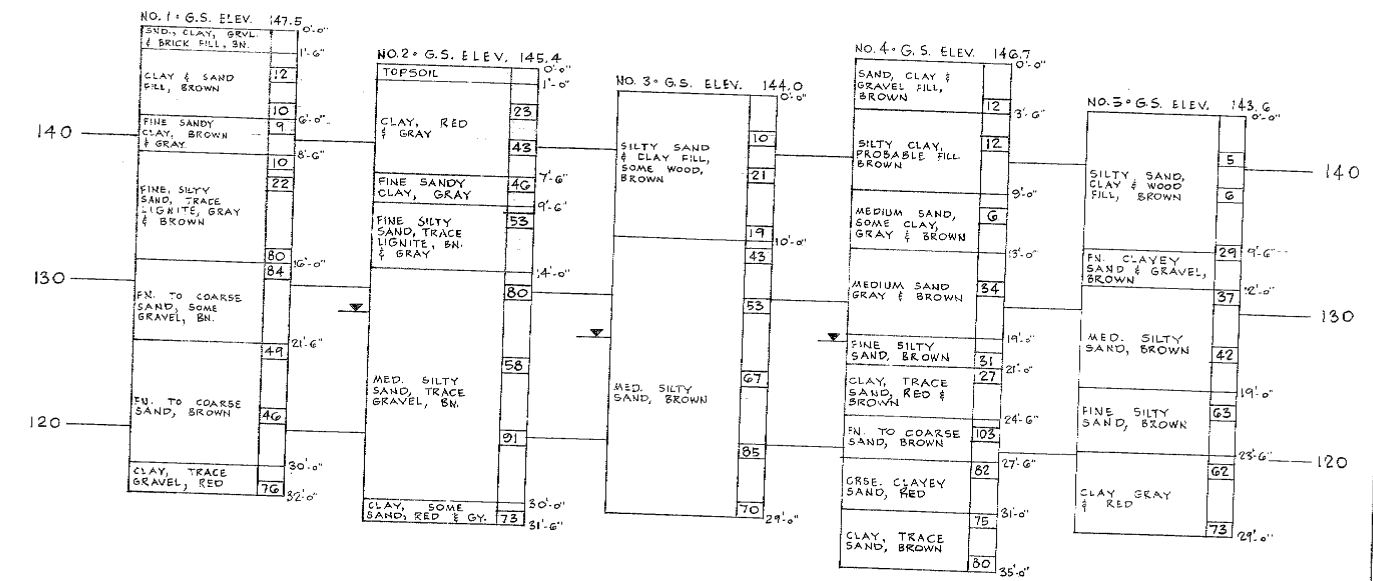
Scale: 1/2" = 1'-0"

WATER LEVEL DATA

BORING NO.	DATE	TIME	WATER LEVEL BELOW SURFACE	CASING IN HOLE	REMARKS
1	12-17	9:50	19'-4"	25'-0"	UPON COMPLETION
		10:00	20'-0"		HOLE BAILED TO 20'-0"
		11:15	18'-5"	NONE	AFTER CASING PULLED
2	12-22	2:30	13'-0"	25'-0"	CAVED AT SURFACE
		2:35	13'-0"		UP COMP.
		3:30	13'-0"		HOLE BAILED TO 19'-6"
3	12-23	3:20	17'-0"	25'-0"	AFT. CAS. PULL
		3:40	17'-0"		4 HOUR READING
		4:00	17'-4"		UP COMP.
		4:00	17'-4"		HOLE BAILED TO 24'-0"
4	12-24	8:00	NO READING	20'-0"	AFT. CAS. PULL
		3:00	18'-0"		CVD AT SURFACE
		3:15	20'-0"		UP COMP.
		3:30	19'-0"		HOLE BAILED TO 20'-0"
5	12-21	10:45	18'-6"	20'-0"	AFT. CAS. PULL
		11:00	21'-6"		UP COMP.
		11:35	18'-6"		AFT. CAS. PULL
12	22-12	12:00	NO READING		CVD AT SURFACE

GENERAL NOTES:

1. NUMBER IN RIGHT HAND COLUMN OF BORING LOG INDICATES BLOWS REQUIRED TO DRIVE 2" O.D. 1 1/8" I.D. SAMPLING SPOON ONE FOOT, USING 140 POUND HAMMER FALLING 30 INCHES.
2. CLASSIFICATION OF SOIL IS BY VISUAL INSPECTION AND IS IN ACCORDANCE WITH THE UNITED SOIL CLASSIFICATION SYSTEM. MAY VARY WITH PRECIPITATION, POROSITY OF THE SOIL, SITE TOPOGRAPHY, ETC.
3. BORING LOCATIONS & ELEVATIONS BY DEPT. PHYSICAL PLANT, UNIVERSITY OF MARYLAND.
4. INFORMATION ON TEST BORING REPORT FROM FOUNDATION TEST SERVICE INC.



BORING LOCATION PLAN

Scale: 1" = 50'-0"

PLOT PLAN

Scale: 1" = 50'-0"

NOTE: Information for this Plot Plan Taken from Survey by McNeill Surveys, Inc. Registered Land Surveyors, Takoma Park, Maryland.

BLDG 34
SIMONEZ HALL

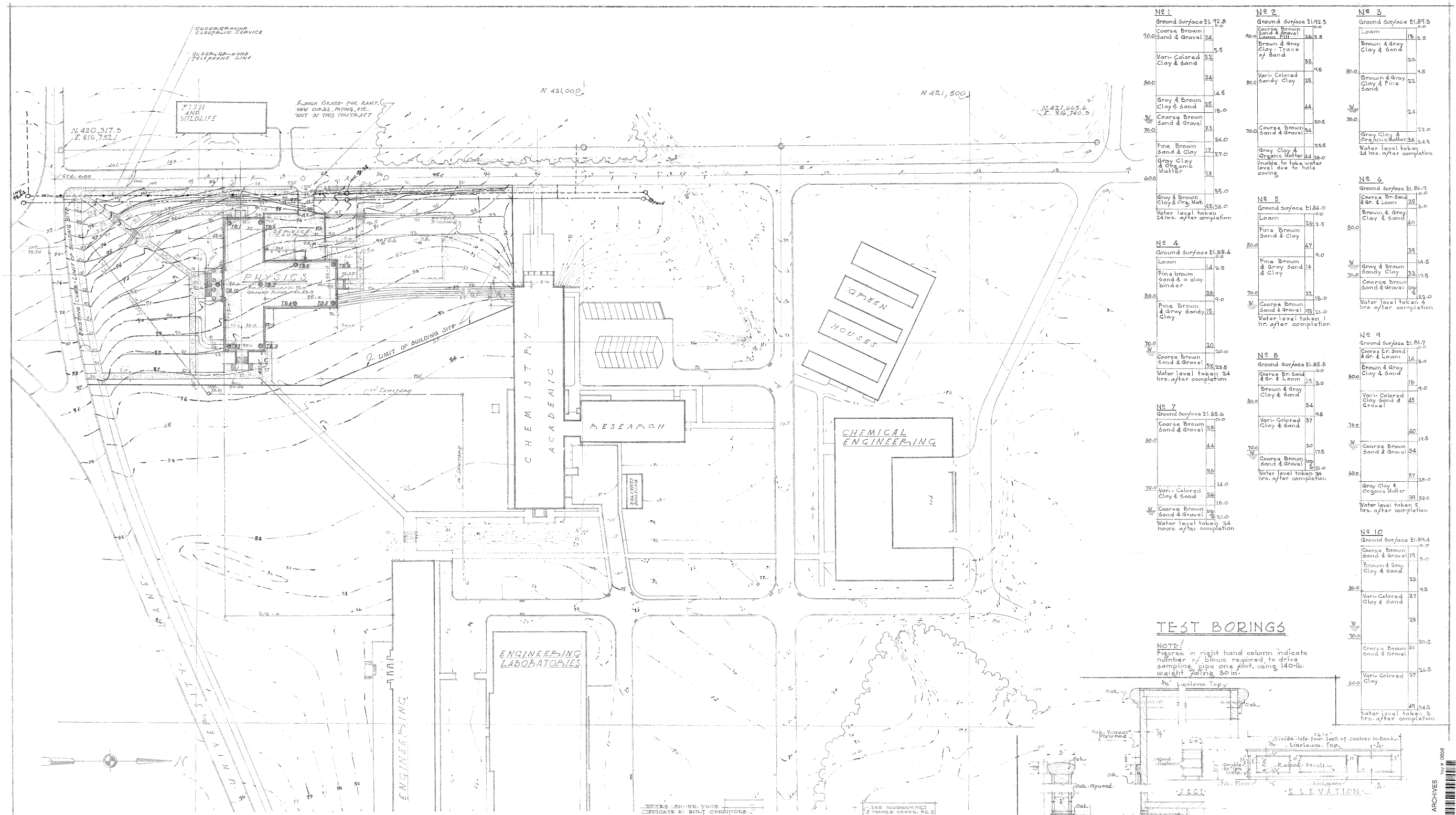
WORK NOT INCLUDED IN THIS CONTRACT

Seeding, Sodding, Sidewalks, Steps, Landscaping, Planting, Roads, Parking Area & Finish grading. See General Description & Scope of Work in the Specifications for Alternates & Unit Prices.

J.L. FAISANT & ASSOCIATES Structural Engineers BALTIMORE MARYLAND COMM. NO. F-5839	H. WALTON REDMILE & ASSOCIATES Mechanical Engineers BETHESDA MARYLAND COMM. NO. 645	WALTON and MADDEN Architects MT. RAINIER MARYLAND COMM. NO. B8-22	APPROVED: APR 5 1960 UNIVERSITY OF MARYLAND George O. Under Superv. Engr.	APPROVED: 22 APR 60 F. McNeill Surveys, Inc.	REVISIONS D.P. Revisions 4-7-60	PLOT PLAN, TEST BORING DATA & DETAILS NEW ACADEMIC BUILDING for UNIVERSITY of MARYLAND College Park, Maryland	DWG. NO. 2 OF 15 JOB NO. U-592 DATE 2-19-60
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ARCHIVES
Building 034
Inventory # 0089
034-0089

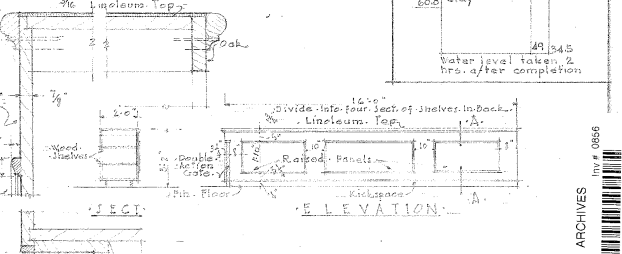
FILE NO. 23 - UM-CP-1449



No 1 Ground Surface El. 92.5 Coarse Brown Sand & Gravel 24 Vari. Colored Clay & Sand 22 Gray & Brown Clay & Sand 24 Coarse Brown Sand & Gravel 23 Fine Brown Sand & Clay 17 Gray Clay & Organic Matter 23 Gray & Brown Clay & Gr. Mat. 22 Water level taken 24 hrs. after completion 22.0	No 2 Ground Surface El. 92.5 Coarse Brown Sand & Gravel 24 Brown & Gray Clay, Trace of Sand 32 Vari. Colored Sandy Clay 35 Coarse Brown Sand & Gravel 24 Gray Clay & Organic Matter 24 Water level taken 24 hrs. after completion 22.0	No 3 Ground Surface El. 92.5 Loam 13 Brown & Gray Clay & Sand 26 Brown & Gray Clay & Fine Sand 22 Gray Clay & Organic Matter 24 Water level taken 24 hrs. after completion 22.0	No 4 Ground Surface El. 88.4 Loam 4 Fine brown sand & a clay binder 26 Fine Brown & Gray sandy clay 15 Coarse Brown Sand & Gravel 26 Water level taken 24 hrs. after completion 22.0	No 5 Ground Surface El. 86.0 Loam 20 Fine Brown Sand & Clay 47 Fine Brown & Gray Sand & Clay 6 Coarse Brown Sand & Gravel 26 Water level taken 1 hr. after completion 22.0	No 6 Ground Surface El. 86.7 Coarse Br. Sand & Gr. & Loam 25 Brown & Gray Clay & Sand 40 Gray & Brown Sandy Clay 32 Coarse Brown Sand & Gravel 26 Water level taken 4 hrs. after completion 22.0	No 7 Ground Surface El. 85.6 Coarse Brown Sand & Gravel 26 Vari. Colored Clay & Sand 24 Coarse Brown Sand & Gravel 26 Water level taken 24 hrs. after completion 22.0	No 8 Ground Surface El. 85.8 Coarse Br. Sand & Gr. & Loam 30 Brown & Gray Clay & Sand 34 Vari. Colored Clay & Sand 37 Coarse Brown Sand & Gravel 30 Water level taken 2 hrs. after completion 22.0	No 9 Ground Surface El. 86.7 Coarse Br. Sand & Gr. & Loam 14 Brown & Gray Clay & Sand 16 Vari. Colored Clay Sand & Gravel 45 Coarse Brown Sand & Gravel 34 Gray Clay & Organic Matter 39 Water level taken 2 hrs. after completion 22.0	No 10 Ground Surface El. 89.4 Coarse Brown Sand & Gravel 19 Brown & Gray Clay & Sand 23 Vari. Colored Clay & Sand 37 Coarse Brown Sand & Gravel 61 Vari. Colored Clay 37 Water level taken 2 hrs. after completion 22.0
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TEST BORINGS

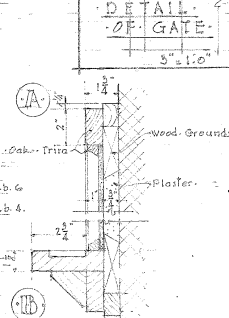
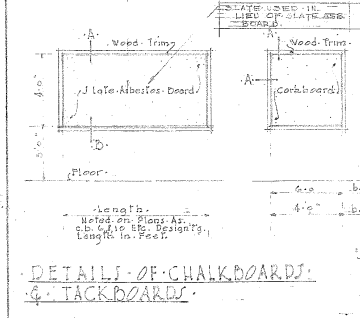
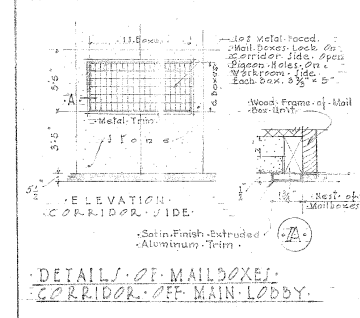
NOTE:
Figures in right hand column indicate number of blows required to drive sampling pipe one foot, using 140-lb. weight falling 30 in.



SITE PLAN
GRADING, ROADS AND WALKS
SCALE 1" = 50'-0"

- LEGEND
- EXISTING CONTOURS SHOWN THUS
 - FINISHED GRADES SHOWN THUS
 - ROUGH GRADE ONLY UNDER THIS CONTRACT
 - NEW SIDEWALKS SHOWN THUS
 - NOT IN CONTRACT
 - NEW CONCRETE CURBS AND CUTTER
 - NEW DRAINAGE E-AND
 - NOT IN CONTRACT
 - NEW CATCH BASINS (NOT IN CONTRACT)
 - REFER TO MECHANICAL DRAWINGS FOR ALL NEW CONNECTIONS TO EXISTING UTILITY LINES

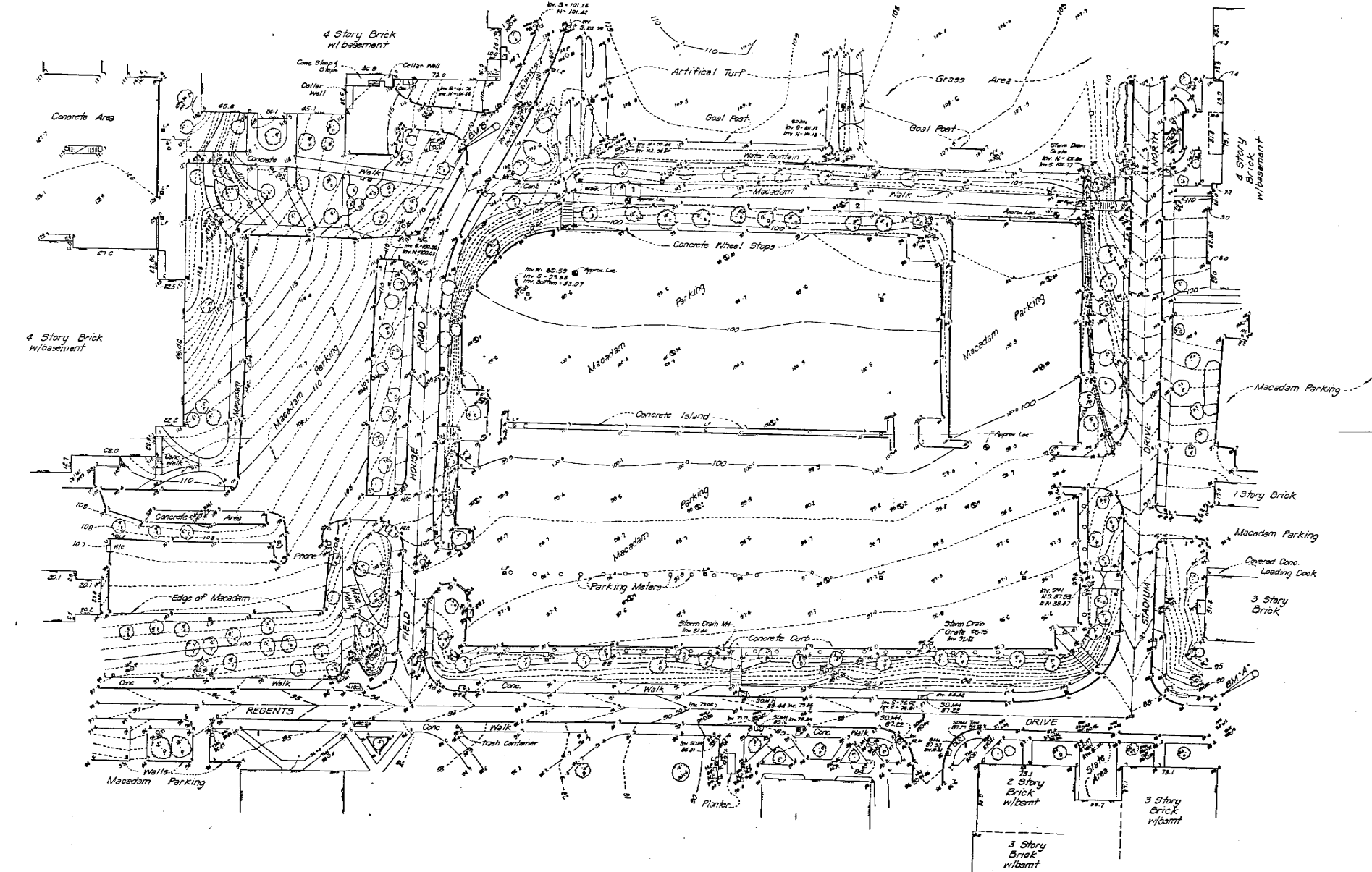
PHYSICS BLDG BLDG 82



THE L. P. BOOKER COMPANY
CONSULTING ENGINEERS
HENRY ADAMS, INC.
CONSULTING ENGINEERS
STATE OF MARYLAND
DEPARTMENT OF PUBLIC IMPROVEMENTS
APPROVED: Dec. 28, 1932 JOB NO. 100-22-003
ARCHITECT: [Signature]
STRUCTURAL: [Signature]
MECHANICAL: [Signature]
ELECTRICAL: [Signature]

PHYSICS BUILDING
FOR
UNIVERSITY OF MARYLAND
COLLEGE PARK, MARYLAND
DR. H. C. BYRD, PRESIDENT
APPROVED FOR THE UNIVERSITY OF MARYLAND
PLOT PLAN
HALL, BORDER AND DONALDSON
ARCHITECTS
1811 ST. PAUL ST., WASHINGTON 25, D. C.
A1

Bldg 202
 1/5
 P. 1000
 C. 1000



BENCHMARK INFORMATION:
 STARTING BENCHMARK: BRASS DISK FOUND
 IN THE TOP OF 12 INCH SQUARE CONCRETE POST.
 LOCATED 105 FOOT S.E. CORNER OF WORCESTER HALL.
 61 FOOT EAST OF THE REAR ENTRANCE TO THE HALL.
 ELEVATION 167.04 FEET
 BENCHMARK SET "A": TOP NUT ON FIRE HYDRANT
 LOCATED ON THE N.W. SIDE OF REIGNS DRIVE ON
 THE NORTH SIDE OF SIDE OF STADIUM DRIVE
 ELEVATION 91.12 FEET
 BENCHMARK SET "B": TOP NUT FIRE HYDRANT
 LOCATED ON THE SOUTH SIDE OF FIELD HOUSE ROAD
 433 ± WEST FROM THE CENTER LINE OF REIGNS DRIVE
 ELEVATION 112.90 FEET

- LEGEND**
- ⊗ LIGHT POLE
 - ⊙ T.M. TELEPHONE MANHOLE
 - ⊙ E.M. ELECTRIC MANHOLE
 - ⊙ S.D.M. STORM DRAIN MANHOLE
 - ⊙ PARKING METERS
 - ⊙ TEST HOLES
 - ⊙ TEST HOLE NUMBER
 - METAL PLATE
 - SIGNS
 - W.V. WATER VALES
 - ⊙ F.H. FIRE HYDRANT
 - △ L.E.A. TRAVERSE
 - ⊙ S.M.H. SEWER MANHOLE
 - ⊙ S.T.M.H. STEAM MANHOLE

SITE SURVEY PREPARED FOR THE UNIVERSITY
 OF MARYLAND AND CONTAINED IN PROJECT
 MANUAL DOCUMENTS OF PROJECT NO. E-670267,
 JANUARY 1986

⊕ N **EXISTING SITE SURVEY**
 1" = 40'-0"

UNIVERSITY OF MARYLAND COLLEGE PARK, 20742	
PARKING GARAGE LOT BB	
CLAS RIGGS OWENS & RAMOS ARCHITECTS 1100 PLEASANT LANE, SUITE 1015, SILVER SPRING, MD. 20910 (202) 333-0880	
BRUNNEN DONOHUE A DIVISION OF THE DONOHUE COMPANIES, INC. CONSTRUCTION COMPANY 2101 WILSON AVENUE, N.W. WASHINGTON, D.C. 20007 (202) 333-0880	
DATE: AUGUST 27, 1986 PROJECT NO. E-670267	DRAWN BY: [Signature] CHECKED BY: [Signature] IN CHARGE: [Signature]

CONTRACTED WITH: University of Maryland		BORING #: B-1				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Hammer Wt.: 140 lbs.		Hole Diam.: 8 in.				
Surf. El.: Hammer Drop: 20 in.		Rock Core Dia.: 8 in.				
Started: 12/16/85 Pipe Size: 6 in.		Boring Method: HSA				
Completed: 12/16/85 Foreman: Kreiner		Inspector: HSA				
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Brown, moist, loose, Clayey SAND (SC)	0	0			Sample No. 4: Op = 2.75 tsf
				1	3 3-4 DS 18	Water Level: Drye After 4 Hrs.: Drye Cave-in @ 22.0'
				2	5 5-6 DS 2	
		5.5	5			
	Light grey, moist, medium dense, Silty SAND (SM), trace fine Gravel			3	15 9-7 DS 12	
		8.0				
	Grayish brown, moist, very stiff, Silty CLAY (CL)			4	8 8-15 DS 12	
			10			
		12.0				
	Yellow brown, moist, very stiff, Clayey SILT (ML)			5	7 8-11 DS 12	
			15			
		17.0				
	Grey, moist, hard, Sandy SILT (ML) trace lignitized wood fragments			6	9 15-16 DS 14	
			20			
			20			
	Grey, moist, hard, Sandy SILT (ML) trace lignitized wood fragments					
		23.0				
	Black, lignitized wood fragments, and grey, moist, hard, Sandy SILT (ML)			7	30 32-30 DS 16	
		25.0				
	Terminated at 25 Ft					

CONTRACTED WITH: University of Maryland		BORING #: B-2				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Surf. El.: 12/16/85		Hole Diam.: 8 in.				
Started: 12/16/85		Rock Core Dia.: 8 in.				
Completed: 12/16/85		Boring Method: HSA				
Foreman: Kreiner		Inspector:				
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Orange brown, moist, medium dense to loose, Clayey SAND (SC), trace to little fine Gravel	0	0			Water on Rod @ 13.0'
				1	7-7 DS 15	Sample No. 4: Op = 2.0 tsf Sample No. 7: Op = 2.0 tsf
				2	6-7 DS 15	
				3	5-5 DS 18	
		8.0				
	Tan, brown speckled, stiff to very stiff, Silty CLAY (CL)			4	6-7 DS 18	
			10			
		13.5				
	Orange to tan, wet, medium dense, Silty SAND (SM)			5	12-17 DS 18	
			15			
				6	8-9 DS 18	
			20			
	Orange to tan, wet, medium dense, Silty SAND (SM)		20			
		22.0				
	Gray, moist, very stiff, Silty CLAY (CL)			7	12-14 DS 18	
			25			
	Terminated at 25 Ft	25.0				

CONTRACTED WITH: University of Maryland		BORING #: B-3				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Hammer Wt.: 140 lbs.		Hole Diam.: 8 in.				
Surf. El.: 12/16/85 Hammer Drop: 20 in.		Rock Core Dia.: 8 in.				
Started: 12/16/85 Pipe Size: 6 in.		Boring Method: HSA				
Completed: 12/16/85 Foreman: Kreiner		Inspector: HSA				
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Dark green, moist, medium dense, Silty SAND (SM), trace fine Gravel	0	8			Water on Rod @ 12.5'
				1	5 6-6 DS 10	Sample No. 7: Op = 3.0 tsf
	Brown, moist, mdium dense, Clayey SAND (SC), some fine Gravel	3.8		2	7 8-12 DS 14	Water Level: 11.0'e Cave-in @ 22.0'e
				3	6 7-6 DS 10	
	Tan, moist to wet, very stiff to hard, Silty CLAY (CL) with Sand Seams	8.0		4	7 10-20 DS 12	
			10			
				5	18 20-20 DS 12	
			15			
	Tan, wet, loose, Clayey SAND (SC)	17.8		6	5 5-5 DS 14	
			20			
	Tan, wet, loose, Clayey SAND (SC)		20			
		22.8				
	Gray, moist, very stiff, Silty CLAY (CL)			9	12-18 DS 12	
				7		
		25.0		25		
	Terminated at 25 Ft					

CONTRACTED WITH: University of Maryland		BORING #: B-4				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Hammer Wt.: 140 lbs.		Hole Diam.: 8 in.				
Surf. El.: Hammer Drop: 30 in.		Rock Core Dia.: 8 in.				
Started: 12/9/85 Pipe Size: 2.0		Boring Method: HSA				
Completed: 12/9/85 Foreman: Kreiner		Inspector:				
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Tan, moist, dense, Silty SAND (SM), little fine Gravel	0	0			Water on Rod @ 18.0'
				1	21 16-16 DS 6	Sample No. 2: Op = 2.5 tsf
		3.0				Sample No. 4: Op = 3.0 tsf
	Tan, moist, stiff, Silty CLAY (CL)			2	9 5-8 DS 8	Sample No. 5: Op = 3.0 tsf
		5.5				Water Level: 15.5'
	Brown, wet, medium dense, Silty SAND (SM) some fine Gravel			3	9 8-8 DS 6	Cave-in @ 16.0'
		8.0				After 24 Hrs. 14.7'
	Tan with brown seams, moist, very stiff to hard, Silty CLAY (CL) with Sand seams			4	5 7-11 DS 12	
			10			
				5	13 13-22 DS 18	
		17.8				
	Brown, wet, medium dense, Silty SAND (SM) some fine Gravel			6	7 8-7 DS 14	
			20			
			20			
	Brown, wet, medium dense, Silty SAND (SM) some fine Gravel					
		22.8				
	Tan, moist, stiff, Sandy SILT (ML)			7	5 6-8 DS 18	
		25.0		25		

CONTRACTED WITH: University of Maryland		BORING #: B-5				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Surf. El.: 12/16/85		Hole Diam.: 8 in.				
Started: 12/16/85		Rock Core Dia.: 8 in.				
Completed: 12/19/85		Boring Method: HSA				
		Inspector: HSA				
		Hammer Wt.: 140 lbs.				
		Hammer Drop: 20 in.				
		Pipe Size: 4 in.				
		Foreman: Scanner				
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Brown, moist, medium stiff, Sandy CLAY (CL)	0	0			Water on Rod @ 17.0'
				3		
				1	3-5 DS 8	Sample No. 6: Op = 3.00 tsf
		3.0				Sample No. 7: Op = 3.00 tsf
	Brown, moist, loose, Clayey SAND (SC)					
				3		
				2	4-5 DS 18	Water Level: 14.9'
		5.5	5			Cave-in @ 15.9'
	Dark gray to grayish tan, moist, medium dense to very dense, Silty SAND (SM), trace to little fine Gravel					After 24 Hrs. Dry-
				3	9-7 DS 18	Cave-in @ 11.5'
				18		
				4	32-30 DS 14	
			10			
		12.8				
	Yellowish tan, wet, medium dense, Clayey SAND (SC)					
				9		
				5	9-7 DS 8	
			15			
		17.8				
	Tannish brown, moist, very stiff to hard, Silty CLAY (CL)					
				6		
				7-9	DS 18	
			20			
			20			
	Tannish brown, moist, very stiff to hard, Silty CLAY (CL)					
				9		
				14-20	DS 18	
			25			
	Terminated at 25 Ft	25.0				

CONTRACTED WITH: University of Maryland		BORING #: B-6				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Surf. El.: 12/16/85		Hole Diam.: 8 in.				
Started: 12/16/85		Rock Core Dia.: 8 in.				
Completed: 12/16/85		Boring Method: HSA				
		Inspector: HSA				
Hammer Wt.: 140 lbs.						
Hammer Drop: 20 in.						
Pipe Size: 6 in.						
Foreman: Kreiner						
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Yellow to brown, moist medium dense, Clayey SAND (SC), little fine Gravel	0		5	10-10 DS 18	Water on Rod @ 17.5'
				7	7-7 DS 18	Sample No. 3: Op = 4.0 tsf Sample No. 4: Op = 2.5 tsf Sample No. 5: Op = 2.0 tsf Sample No. 7: Op = 1.75 tsf
		5.5		4	7-7 DS 18	Water Level: 22.5' Cave-in @ 23.5' After 24 Hrs.: 18.0'
	Brown, moist, stiff to very stiff, Silty CLAY (CL)			5	7-11 DS 18	
				4	7-7 DS 12	
				5	7-11 DS 18	
		17.0				
	Gray, moist, stiff, Clayey SILT (ML) with Sand Seams			7	6-11 DS 18	
				5	6-11 DS 18	
	Gray, moist, stiff, Clayey SILT (ML) with Sand Seams					
	Gray, moist, very stiff, Silty CLAY (CL)					
		25.0				
	Terminated at 25 Ft					

CONTRACTED WITH: University of Maryland		BORING #: B-7				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
Datum: Surf. El.: 12/16/85		Hole Diam.: 8 in.				
Started: 12/16/85		Rock Core Dia.: 8 in.				
Completed: 12/16/85		Boring Method: HSA				
		Inspector:				
Hammer Wt.: 140 lbs.						
Hammer Drop: 20 in.						
Pipe Size: 6 in.						
Foreman: Kreiner						
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
		0				
	Tannish brown, dark brown, moist, very stiff, Sandy SILT (ML)			4		Water on Rod @ 18.5'
				6-12	DS 12	Sample No. 7: Op = 3.0 tsf
				7		Water Level: 22.0'
				9-16	DS 15	Cave-in @ 23.0'
						After 24 Hrs.: 14.8'
		5.5				
	Tan, yellow brown, moist to wet, medium dense to very dense, Silty SAND (SM), little to some fine Gravel			16		
				11-11	DS 10	
				20		
				25-33	DS 12	
				11		
				16-11	DS 18	
		17.0				
	Tannish brown, moist, very stiff, Sandy SILT (ML) with Sand seams, trace Clay			7		
				8-9	DS 15	
		20				
	Tannish brown, moist, very stiff, Sandy SILT (ML) with Sand seams, trace Clay					
				6		
				7-14	DS 18	

CONTRACTED WITH: University of Maryland		BORING #: B-8				
PROJECT NAME: Parking Garage		JOB #: 11-51874				
LOCATION: College Park, Maryland						
SPRINGER						
Datum: Surf. El.: 140 lbs.		Hole Diam.: 8 in.				
Started: 12/16/85		Rock Core Dia.: 8 in.				
Completed: 12/16/85		Boring Method: HSA				
		Inspector:				
Hammer Wt.: 140 lbs.						
Hammer Drop: 20 in.						
Pipe Size: 6 in.						
Foreman: Kreiner						
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	NO.	SAMPLE DATA	NOTES
					BLOWS/6" TYPE REC.	
	Brown, moist, medium stiff, Sandy CLAY (CL)	0	0			Sample No. 2: Op = 2.0 tsf Sample No. 4: Op = 3.0 tsf Sample No. 6: Op = 3.0 tsf Sample No. 7: Op = 2.5 tsf
				3		
				1	3-5 DS 18	
	Greenish brown, moist, stiff, Clayey SILT (ML)	3.0				Sample No. 6: Op = 3.0 tsf Sample No. 7: Op = 2.5 tsf
				5		
				2	5-9 DS 18	
	Dark green, moist, stiff, Sandy CLAY (CL) trace lignitized wood fragments	5.5	5			Water Level: Drye Cave-in @ 22.8' After 24 Hrs.: 14.8'
				3	5-7 DS 18	
	Greenish brown, moist, medium stiff, Sandy SILT (ML), trace Clay	8.0				
				4		
				4	5-5 DS 18	
	Tannish brown, moist, medium dense, Silty SAND (SM)	12.0				
				9		
				5	6-8 DS 15	
				15		
	Greenish brown, moist, very stiff, Silty CLAY (CL)	17.8				
				9		
				6	11-13 DS 18	
				20		
	Greenish brown, moist, very stiff, Silty CLAY (CL)	22.0				
				6		
	Grayish brown, moist, very stiff, Clayey SILT (ML), trace fine Sand	25.0				
				7	8-13 DS 16	
	Terminated at 25 Ft	25.0	25			

BORINGS AND LOGS
ATEC ASSOCIATES
DATED DECEMBER 1985

BORING DATA

10' 0" 2' 0" 4' 0" 6' 0" 8' 0" 10' 0" 12' 0" 14' 0" 16' 0" 18' 0" 20' 0" 22' 0" 24' 0" 26' 0" 28' 0" 30' 0"

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10' 0" 2' 0" 4' 0" 6' 0" 8' 0" 10' 0" 12' 0" 14' 0" 16' 0" 18' 0" 20' 0" 22' 0" 24' 0" 26' 0" 28' 0" 30' 0"

10' 0" 2' 0" 4' 0" 6' 0" 8' 0" 10' 0" 12' 0" 14' 0"

CONTRACTED WITH: University of Maryland PROJECT NAME: Parking Garage LOCATION: College Park		BORING #: B-9 JOB #: XI-51874		
Datum: Surf. El.: 12/11/85 Started: 12/11/85 Completed: 12/11/85		Hole Diam.: 8 in. Rock Core Dia.: 8 in. Boring Method: HSA Inspector: HSA		
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH SCALE	SAMPLE DATA NO. BLOWS/6" TYPE REC.	NOTES
0	Brown, moist, dense to medium dense, Clayey SAND (SC), little fine Gravel	0	14	Sample No. 6 Op = 1.5 tsf Sample No. 7s Op = 2.5 tsf
		1	16-20 DS	15
		2	18	Water Level: Dry Cave-in @ 22.0' After 24 Hrs.: Dry
		5	12-11 DS	18
	Brown, moist, very stiff, Clayey SILT (ML), trace fine Gravel at the top	5.5	7	
		3	8-8 DS	15
		4	7	
		10	8-11 DS	2
		5	8	
		15	12-14 DS	3
		17.8		
	Brown to greenish brown, moist, very stiff, Silty CLAY (CL), trace fine Sand		7	
		20	8-11 DS	12
		20		
	Brown to greenish brown, moist, very stiff, Silty CLAY (CL), trace fine Sand		9	
		7	12-12 DS	12
25.0	Terminated at 25 Ft	25.0		

CONTRACTED WITH: University of Maryland		BORING #: B-10	
PROJECT NAME: Parking Garage		JOB #: XI-51874	
LOCATION: College Park, Maryland			
SAMPLER		Hole Diam.: 8 in.	
Hammer Wt.: 140 lbs.		Rock Core Dia.: 8 in.	
Hammer Drop: 25 in.		Boring Method: HSA	
Pipe Size: 6 in.		Inspector:	
Foreman:			
Datum: Surf. El.: 12/9/85			
Started: 12/9/85			
Completed: 12/27/85			

ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	SAMPLE DATA			NOTES	
			DEPTH SCALE	NO. BLOWS/6" TYPE	REC.		
0	Dark green, brown, moist, medium dense, Clayey SAND (SC), trace fine Gravel	0	0			Water on Rod @ 13.5'	
		1	7-6	DS	6	Sample No. 7s Op = 1.75 tsf	
		2	10			Water Level: 15.0'	
		3	9-8	DS	12	Cave-in @ 16.5'	
		4	5-8	DS	8	After 24 Hrs.: 14.5'	
		5					
		6					
		7					
		8					
		9					
10	Gray, tan, yellow, moist to wet, very dense to medium dense, Silty coarse SAND (SM) little fine to medium Gravel	10	4	48-55	DS	12	
		11					
		12					
		13					
		14					
		15	5	10-12	DS	3	
		16					
		17					
		18					
		19					
20	Gray, tan, yellow, moist to wet, very dense to medium dense, Silty coarse SAND (SM) little fine to medium Gravel	20	6	11-9	DS	10	
		21					
		22					
		23					
		24					
		25					
		26					
		27					
		28					
		29					
22.0	Gray, tan, yellow, moist to wet, very dense to medium dense, Silty coarse SAND (SM) little fine to medium Gravel	22.0					
		23.0					
		24.0					
		25.0					
		26.0					
		27.0					
		28.0					
		29.0					
		30.0					
		31.0					
25.0	Gray, moist, very stiff, Clayey SILT (ML)	25.0	7	9-12	DS	10	
		26.0					
		27.0					
		28.0					
		29.0					
		30.0					
		31.0					
		32.0					
		33.0					
		34.0					

CONTRACTED WITH: University of Maryland		BORING #: B-11			
PROJECT NAME: Parking Garage		JOB #: XI-51874			
LOCATION: College Park, Maryland					
Datum: Surf. El.: 12/10/85		Hole Diam.: 8 in.			
Started: 12/10/85		Rock Core Dia.: 8 in.			
Completed: 12/10/85		Boring Method: HSA			
		Inspector: HSA			
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH SCALE	DEPTH NO.	BLOWS/6" TYPE REC.	NOTES
		0	8		
	Tan with red seams, yellow brown, moist, stiff to very stiff, Sandy SILT (ML), trace Clay, some fine medium Gravel in Sample No. 3	1	4	DS 14	Water on Rod @ 13.5'
		2	7-8		Sample No. 7
		3	7-7	DS 14	Op = 1.5 tsf
		4	7		Water Level: 17.5'
		5	7-7	DS 14	Cave-in @ 19.5'
		6	8-7	DS 18	After 24 Hrs.: 15.0'
		7	8-4	DS 15	
		10	11		
		12.8	14-17	DS 12	
		15	7		
		20	7-11	DS 14	
		28			
	Tan, yellow, wet, dense to medium dense, Silty SAND (SM), trace fine Gravel at the top	22.8			
	Gray, moist, very stiff, Silty CLAY (CL)	25.0			
	Terminated at 25 Ft	25.0	7	8-11 DS 18	

CONTRACTED WITH: University of Maryland		BORING #: B-12	
PROJECT NAME: Parking Garage		JOB #: XI-51874	
LOCATION: College Park, Maryland			
Datum: 148 lbs.		Hole Diam.: 8 in.	
Surf. El.: 12/11/85		Rock Core Dia.: 8 in.	
Started: 12/11/85		Boring Method: HSA	
Completed: 12/11/85		Inspector: HSA	
Foreman: CRANDER			

ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	SAMPLE DATA			NOTES
				NO.	BLOWS/6"	TYPE REC.	
	Dark green, moist, medium dense, Silty SAND (SM)	0	0				Sample No. 4 Op = 3.8 ts
				1	9-12	DS	12 Sample No. 5 Op = 3.8 ts
		3.0					Sample No. 6 Op = 2.5 ts
	Brown, moist, dense to medium dense, Clayey SAND (SC)			2	20-26	DS	12 Sample No. 7 Op = 2.5 ts
	Little fine to medium Gravel			5			Water Level: 17.5' Drye Cave-in @ 22.5'
					10		
				3	11-11	DS	10 After 24 Hr. 5.0'
		8.0					
	Tan to brown, moist, very stiff, Silty CLAY (CL)			4	9-13	DS	12
					8		
				10			
					9		
				5	10-12	DS	10
					9		
				15			
					6	12-14	DS 10
				20			
					8		
				7	11-12	DS	12
				25			
					9		
				25.0			

CONTRACTED WITH: University of Maryland		BORING #: B-13					
PROJECT NAME: Parking Garage		JOB #: XI-51874					
LOCATION: College Park, Maryland							
Datum: Surf. El.: 12/10/85		Hole Diam.: 8 in.					
Started: 12/10/85		Rock Core Dia.: 8 in.					
Completed: 12/11/85		Boring Method: HSA					
		Inspector: HSA					
		Foreman: G. J. J. J.					
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH SCALE	DEPTH SCALE	SAMPLE DATA NO.	BLOWS/6" TYPE	REC.	NOTES
		0	0				
	Dark green, moist, loose, Silty SAND (SM), trace Clay			6			Water on Rod @ 17.5'
			1	5-5	DS	18	Water Level: 16.2'
		3.8					Cave-in @ 16.8'
	Brown to reddish brown, moist, loose to medium dense, Clayey SAND (SC)		2	3	DS	16	After 24 Hrs. Dry
			5	4-4			Cave-in @ 15.5'
				7			
			3	6-8	DS	18	
				9			
			4	7-8	DS	18	
			10				
		12.8					
	Tan to yellow, moist, to wet, medium dense, loose to medium dense, Silty SAND (SM)			16			
			5	12-13	DS	18	
			15				
				3			
			6	3-4	DS	8	
			20				
			28				
	Tan to yellow, moist, to wet, medium dense, loose to medium dense, Silty SAND (SM)			4			
				3-8	DS	4	
			7				
		25.0					
		25.0					
			25				

CONTRACTED WITH: University of Maryland		BORING #: B-14		
PROJECT NAME: Parking Garage		JOB #: XI-51874		
LOCATION: College Park, Maryland				
Datum: Hammer Wt.: 140 lbs.		Hole Diam.: 8 in.		
Surf. El.: Hammer Drop: 24 in.		Rock Core Dia.: 8 in.		
Started: 12/12/85		Boring Method: HSA		
Completed: 12/12/85		Inspector: HSA		
Foreman: K. J. K. J.				
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH SCALE	SAMPLE DATA NO. BLOWS/6" TYPE REC.	NOTES
		0		
	Green, moist, medium stiff, Sandy SILT (ML)		5	Water on Rod @ 18.0'
			5-5	Water Level: 16.0'
		3.8		Cave-in @ 16.5'
	Gray, black, moist, stiff, Sandy SILT (ML), trace Clay, trace to little lignitized wood fragments		4	After 24 Hrs.: 15.5'
			7-7	
		5		
			4	
			5-7	
		3		
			5	
			5-6	
		4		
		18		
		12.8		
	Light gray to yellow, moist to wet, medium dense to dense, Silty coarse SAND (SM), trace to little fine to medium Gravel		14	
			13-11	
		5		
		15		
			12	
			18-25	
		6		
		28		
		20		
	Light gray to yellow, moist to wet, medium dense to dense, Silty coarse SAND (SM), trace to little fine to medium Gravel		38	
			30-15	
		7		
		25.0		
		25		

CONTRACTED WITH: University of Maryland		BORING #: B-15	
PROJECT NAME: Parking Garage		JOB #: XI-5187	
LOCATION: College Park, Maryland			
SAMPLER		Hole Diam.: 8 in.	
Hammer Wt.: 140 lbs.		Rock Core Dia.: 8 in.	
Hopper Drop: 30 in.		Boring Method: HSA	
Pipe Size: 4 in.		Inspector:	
Foreman: K. R. R.			
Datum: Surf. El.: 12/12/85			
Started: 12/12/85			
Completed: 12/12/85			

ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH	DEPTH SCALE	SAMPLE DATA			NOTES
				NO.	BLOWS/6" TYPE	REC.	
		0	0				
	Greenish brown, moist, dense Clayey SAND (SC) trace fine Gravel			1	15 DS	14	Sample No. 5 Op = 2.5 t Sample No. 6 Op = 2.5 t Sample No. 7 Op = 2.8 t
		3.8					
	Tannish brown, moist, very dense, Silty SAND (SM), little fine Gravel			2	100/5 DS	5	Water Level Dry Cave-in @ 20.8' After 24 H Dry
		5.5					
	Tannish brown, moist, dense to medium dense, Silty medium to fine GRAVEL (GM), trace Clay			3	10-25 DS	12	

CONTRACTED WITH: University of Maryland PROJECT NAME: Parking Garage LOCATION: College Park		BORING #: B-16 JOB #: XI-51874		
Datum: Surf. El.: 12/11/85 Started: 12/11/85 Completed: 12/11/85		Hole Diam.: 8 in. Rock Core Dia.: 8 in. Boring Method: HSA Inspector: HSA		
ELEV.	MATERIAL DESCRIPTION	STRA. DEPTH SCALE	SAMPLE DATA NO. BLOWS/6" TYPE REC.	NOTES
0	Dark green, moist, medium dense, Silty SAND (SM)	0	6	Water on Rod @ 18.0' Sample No. 3s Op = 2.5 tsf Sample No. 7s Op = 1.8 tsf Water Level: 17.8' Cave-in @ 18.3' After 24 Hrs.: 15.0'
3.8		3.8	6	
5	Light brown, moist, stiff, Sandy CLAY (CL)	5	4	
10		10	4	
12.8		12.8	4	
15		15	4	
20		20	4	
25.0	Tan, yellow brown, moist to wet, Silty SAND (SM), some fine to medium Gravel	25.0	4	
25.0	Terminated at 25 Ft	25.0		

BORINGS AND LOGS
ATEC ASSOCIATES
DATED DECEMBER 1985

BORING DATA

UNIVERSITY OF MARYLAND
DEPARTMENT OF PHYSICAL PLANNING
201 MICHIGAN AVENUE, N.W.
WASHINGTON, D.C. 20007
(202) 338-0000

A DIVISION OF THE DONOHUE COMPANIES, INC.
CLAS RIGGS OWENS - FRAMOS

PARKING GARAGE LOT BB
UNIVERSITY OF MARYLAND
COLLEGE PARK
20742

DATE: AUGUST 27, 1986

B-2

CONTRACTED WITH: University of Maryland		BORING #:	B-17
PROJECT NAME: Parking Garage		JOB #:	40-6171
LOCATION: College Park, Maryland			
Datum: 12/16/85		Hammer Wt.: 140 lbs.	Hole Diam.: 8 in.
Started: 12/16/85		Hammer Drop: 30 in.	Rock Core Dia.: 8 in.
Completed: 12/16/85		Pipe Size: 4 in.	Boring Method: HSA
		Foreman: K. R. R.	Inspector: HSA

ELEV.	DESCRIPTION	DEPTH	SCALE	NO.	BLOWS/6"	TYPE	REC.	NOTES
0	Greenish brown, moist, medium dense, Silty SAND (SM), little fine Gravel	0		1	6-8	DS	12	Water on Rod @ 17.0'
3.0	Tan, moist, medium stiff Silty CLAY (CL)	3.0		2	4-5	DS	12	Water Level: Drye Cave-in @ 17.0'
8.0	Gray, moist, medium stiff, Sandy SILT (ML)	8.0		4	4-5	DS	10	
12.0	Brown, moist to wet, medium dense to dense, Silty SAND (SM), trace to some fine Gravel	12.0		5	7-9	DS	18	
22.0	Brown, moist to wet, medium dense to dense, Silty SAND (SM), trace to some fine Gravel	22.0		7	9-10	DS	12	
25.0	Light gray, yellow, seams, moist, medium dense, Clayey SAND (SC)	25.0		7	9-10	DS	12	Terminated at 25 Ft.

CONTRACTED WITH: University of Maryland		BORING #:	B-18
PROJECT NAME: Parking Garage		JOB #:	40-6171
LOCATION: College Park, Maryland			
Datum: 12/12/85		Hammer Wt.: 140 lbs.	Hole Diam.: 8 in.
Started: 12/12/85		Hammer Drop: 30 in.	Rock Core Dia.: 8 in.
Completed: 12/12/85		Pipe Size: 4 in.	Boring Method: HSA
		Foreman: K. R. R.	Inspector: HSA

ELEV.	DESCRIPTION	DEPTH	SCALE	NO.	BLOWS/6"	TYPE	REC.	NOTES
0	Greenish brown, moist, very stiff Sandy SILT (ML), trace Gravel	0		1	10-10	DS	3	Water on Rod @ 14.0'
3.0	Green to black, moist, medium dense, Clayey SAND (SC), trace lignitized wood fragments	3.0		2	5-8	DS	10	Sample No. 7: Op = 1.0 tsf
5.5	Tannish brown, moist, dense, Silty SAND (SM)	5.5		3	9-28	DS	18	Water Level: 20.0' Cave-in @ 23.0' After 24 Hrs.: 17.0'
12.0	Tannish brown, moist to wet, medium dense to dense, Clayey SAND (SC), trace fine Gravel	12.0		5	11-15	DS	15	
22.0	Tannish brown, moist to wet, medium dense to dense, Clayey SAND (SC), trace fine Gravel	22.0		7	13-20	DS	6	
25.0	Brown, moist, hard, Silty CLAY (CL), trace fine Gravel	25.0		7	13-20	DS	6	Terminated at 25 Ft.

CONTRACTED WITH: University of Maryland		BORING #:	B-19
PROJECT NAME: Parking Garage		JOB #:	40-6171
LOCATION: College Park, Maryland			
Datum: 12/11/85		Hammer Wt.: 140 lbs.	Hole Diam.: 8 in.
Started: 12/11/85		Hammer Drop: 30 in.	Rock Core Dia.: 8 in.
Completed: 12/11/85		Pipe Size: 4 in.	Boring Method: HSA
		Foreman: K. R. R.	Inspector: HSA

ELEV.	DESCRIPTION	DEPTH	SCALE	NO.	BLOWS/6"	TYPE	REC.	NOTES
0	Gray, moist, very stiff, Silty CLAY (CL), trace Sand	0		1	6-8	DS	18	Sample No. 6: Op = 4.0 tsf Sample No. 7: Op = 2.5 tsf
4.0	Brown, moist, stiff, Sandy CLAY (CL)	4.0		2	5-9	DS	0	Water Level: Drye Cave-in @ 22.5' After 24 Hrs.: Drye
8.0	Reddish brown, moist, medium dense, Clayey SAND (SC)	8.0		4	7-7	DS	14	
12.0	Brown, reddish brown to light gray, stiff to very stiff, Silty CLAY (CL)	12.0		5	6-8	DS	18	
20	Brown, reddish brown to light gray, stiff to very stiff, Silty CLAY (CL)	20		6	9-12	DS	18	
25.0	Brown, reddish brown to light gray, stiff to very stiff, Silty CLAY (CL)	25.0		7	9-13	DS	18	Terminated at 25 Ft.

Client: Meyer Associates, P.A.
Project: University of Maryland Parking Garage
Location: College Park, Maryland
Boring #: A Page 1 of 2
Project #: 40-6171
Elevation: 99.5'

Client: Meyer Associates, P.A.
Project: University of Maryland Parking Garage
Location: College Park, Maryland
Boring #: B Page 1 of 2
Project #: 40-6171
Elevation: 102.5'

Client: Meyer Associates, P.A.
Project: University of Maryland Parking Garage
Location: College Park, Maryland
Boring #: C Page 1 of 3
Project #: 40-6171
Elevation: 98.5'

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140 lbs. Drop 30"

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
91.0	4" of Blacktop 3" of Crusher Run Moist, Grayish Brown, loose Sandy SILT with some Clay and small Gravel (FLL) Moist Grayish Brown loose Clayey SAND with some Roots (FLL)	0		0	2-3	1	DS	18
86.5	Moist Grayish Brown dense SAND and GRAVEL (SP)	5		0	4-5	2	DS	18
82.0	Wet Light Grayish Brown, loose, Silty SAND & GRAVEL with Silty Clay layers (SP)	10		0	29-20	3	DS	10
76.0	Moist, Brownish Gray, very stiff, Clayey SILT (ML)	15		0	7-2	4	DS	18
73.5	Moist Gray, hard, Silty CLAY with Lignite (CL)	20		0	5-9	5	DS	18
73.5	Moist Black Silty LIGNITE	25		0	8-15	6	DS	18

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140 lbs. Drop 30"

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
94.5	4" of Blacktop 3" of Crusher Run Moist Grayish Brown, medium dense, SAND and GRAVEL, trace Topsoil (FLL)	0		0	4	1	DS	18
78.5	Moist, Reddish Brown, Mottled, stiff to very stiff, Clayey SILT (ML)	5		0	7	2	DS	10
78.5	Moist, Gray, stiff to hard, Silty CLAY with Lignite (CL)	10		0	10-12	3	DS	18
78.5	Moist, Gray, stiff to hard, Silty CLAY with Lignite (CL)	15		0	12-15	4	DS	18
78.5	Moist, Gray, stiff to hard, Silty CLAY with Lignite (CL)	20		0	5	5	DS	18
78.5	Moist, Gray, stiff to hard, Silty CLAY with Lignite (CL)	25		0	6-8	6	DS	18

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140 lbs. Drop 30"

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
95.5	5" of Asphalt 6" of Crushed Rock Moist, Gray & Brown Silty SAND & CLAY (FLL)	0		0	4-5	1	DS	16
90.5	Moist, Clayey, Silty, Cinder, Sand, Gravel (FLL)	5		0	3-6	2	DS	18
78.0	Medium to Coarse Brown, medium dense to dense Silty SAND and GRAVEL (SP-GP)	10		0	18-20	3	DS	18
78.0	Var-colored, very stiff, Silty CLAY, some Sand (CL)	15		0	9-11	4	DS	18
78.0	Var-colored, very stiff, Silty CLAY, some Sand (CL)	20		0	12-20	5	DS	6
78.0	Var-colored, very stiff, Silty CLAY, some Sand (CL)	25		0	5-11	6	DS	18

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
46.5	Moist, Red & Grey, hard CLAY (CL)	52.0'						
43.0	Test Boring Terminated @ 55.6'	55.5'						

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
71.5	Moist Black Silty LIGNITE	28.0'						
63.5	Moist Gray, fine, hard, Sandy Silty CLAY (CL)	30		0	9-15	7	DS	18
63.5	Moist Gray, very stiff, Silty CLAY with Lignite (CL)	35		0	5-8	8	DS	18
55.5	Moist Gray, hard, Silty CLAY (CL)	40		0	5-13	9	DS	18
51.5	Moist, dense, Brownish Gray, fine hard, Sandy Silty CLAY (CL)	45		0	10-20	10	DS	18
49.5	Moist, dense, Brownish Gray, fine hard, Sandy SILT with some Clay (ML)	50		0	12-40	11	DS	18

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
69.5	Moist, Gray, hard, Silty CLAY with Lignite (CL)	33.0'		0	11-20	7	DS	18
69.5	Moist, Gray, hard, Silty CLAY (CL)	35		0	12-20	8	DS	18
69.5	Moist, Gray, hard, Silty CLAY (CL)	40		0	11	9	DS	18
69.5	Moist, Gray, hard, Silty CLAY (CL)	45		0	10	10	DS	18
69.5	Moist, Gray, hard, Silty CLAY (CL)	50		0	23	11	DS	18

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	Cond.	BloWS/6"	No.	Type	Rec.
71.5	Moist, Grayish, very stiff, Silty CLAY, some Sand & Mica (CL)	27.0'		0	5-9	7	DS	18
65.5	Moist, Gray, hard, Sandy CLAY with Lignite (CL)	33.0'		0	12-35	8	DS	18
61.5	Gray and Brown, very stiff, Silty CLAY (CL)	37.0		0	6-10	9	DS	18
55.5	Moist, Gray & Red, hard, Silty CLAY (CL)	43.0'		0	10-12	10	DS	18
52.5	Moist, Reddish Gray and Brown, hard, Silty CLAY (CL)	46.0'		0	10-20	11	DS	18

BORINGS AND LOGS
ATEC ASSOCIATES
DATED DECEMBER 1985

BORING DATA

2101 WISCONSIN AVENUE, N.W.
WASHINGTON, D.C. 20007
(202) 333-0886
A DIVISION OF THE DONOHUE COMPANIES, INC.
CLAY RIGGS OWENS & RAMOS
ARCHITECTS
1110 EISENBERG LANE, SUITE 400, SILVER SPRING, MD 20910

PARKING GARAGE LOT B5
UNIVERSITY OF MARYLAND
COLLEGE PARK, 20742

BORINGS AND LOGS
INDEPENDENT TESTING LABORATORIES
DATED JULY 1986

B-3

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140lbs. Drop 30"								
ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
96.0	3" of Asphalt 4" of Crashed Rock Moist, Silty, Sand, Cinder, Gravel (FILL)	2.0'	D		4-5 7	1	DS	16
92.0	Moist, Reddish Grey CLAY with Sand & Gravel (FILL)	6.0'	D		5-5 7	2	DS	8
85.0	Moist, Brown, Sandy SILT, with Wood & Gravel (FILL)	13.0'	D		3-4 4	3	DS	14
81.0	Moist, medium Grey, dense, Silty SAND and GRAVEL (SP- SD)	17.0'	D		10-22 20	4	DS	18
75.0	Wet, medium to coarse Brown, very dense, Silty SAND & GRAVEL (SP-GP)	23.0'	D		10-28 30	5	DS	18

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
71.0		27.0'						
	Moist, Grey Clayey, stiff, SILT with Sand Layers (H-L)		30	I	4-5 10	7	DS	18
65.0		33.0'						
	Moist, Grey Silty, hard, CLAY (CL)		35	I	8-14 20	8	DS	18
60.0		38.0'						
	Moist, Grey & Red, very stiff, Silty CLAY (CL)		40	I	10-11 16	9	DS	18
56.0		42.0'						
	Moist, Grey, hard, Silty CLAY, some Sand (CL)		45	I	10-21 33	10	DS	18
52.0		46.0'						
	Moist, Red & Grey, hard, CLAY, trace Sand (CL)							
47.5		50.5'	50	I	12-30 33	11	DS	18
	Test Boring Terminated @ 50.5'							

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140 lbs. Drop 30"								
ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
	3" Asphalt 8" Gravel		2.5	D	6 6-8	1	DS	14
	Moist, Orange, Brown, Red, stiff Silty Sandy CLAY, with some Gravel (FILL)	5.5'	5	I	4 5-7	2	DS	17
	Moist, Orangish Brown to Light Brown, mottled, stiff, Silty CLAY (CL)		7.5	I	4 6-7	3	DS	14
		9.5'	10	I	6 7-9	4	DS	17
	Moist, Reddish Brown, stiff Silty CLAY (CL)		15	I	5 7-9	5	DS	17
			20	I	4 7-7	6	DS	17
		22.0'			Water on Rod @ 20.0'			
	Moist to wet, Grey, medium dense to dense, fine to medium SAND with Lignite (SP)		25	D	5 7-10	7	DS	17

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
	Moist to wet, Grey, medium dense to dense, fine to medium SAND with Lignite (SP)							
			D	4 7-15	8	DS	18	
			D	10 9-9	9	DS	18	
			L	12 16-20	10	DS	0	
	Test Boring Terminated @ 40.0'	40.0'	40					
			45					
			50					

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140 lbs. Drop 30"									
ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE					
				Cond.	Blows/6"	No.	Type	Rec.	
	Moist, Orange, Brown, and Red, medium stiff to stiff, Silty CLAY (FLL)	8.0'	2.5	D	2 5-8	1	DS	1	
5			I	4 4-5	2	DS	14		
			D	6 7-7	3	DS	12		
7.5			I	6 7-10	4	DS	14		
	Moist Orangish Brown, medium dense Silty SAND, trace small Gravel (SP)	12.0'	10	I					
		12.5'							
	GRAVEL Layer								
	Moist, Grey, Brown, and Black, clayey SAND, trace Gravel (SP)		15	D	4 3-4	5	DS	14	
20			D	5 4-9	6	DS	3		
		22.5'							
	Wet Orangish Brown, Silty SAND, trace Clay (SP)		25	D	5 8-8	7	DS	6	

Water on Rod = 20.0"

ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
	Wet Orangish Brown, Silty SAND, trace Clay (SP)	28.0'						
	Wet, Grey, very stiff to hard Silty CLAY with Lignite (CL)		30	1	9 14-15	8	DS	18
			35	1	11 15-21	9	DS	18
		40.0'	40	1	9 11-21	10	DS	18
	Test Boring Terminated @ 40.0'		45					
			50					

ASTM D-1586 Hollow Stem Auger 6.5" diameter Hammer Weight 140 lbs. Drop 30"								
ELEV.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
	3" Asphalt							
	2" Gravel		2.5	I	3	1	DS	16
	2" Asphalt				2-4			
	3" Gravel				2	2	DS	14
	Brown to Black, moist, loose, Silty SAND (FILL)	3.0'	5	I	2-3			
	Orangeish Brown to Grey, very loose to medium dense, moist, Silty SAND, trace Clay (H-L) (FILL)	8.0'	7.5	D	4	3	DS	17
					7-10			
	Orange, moist, medium dense, Clayey SAND (SP) (FILL)	12.0'	10	D	4	4	DS	17
					10-12			
	Light Brown to Yellow, wet, medium dense, Silty SAND and GRAVEL (SP-GP)		15	D	13	5	DS	14
					13-11			
			20	D	12	6	DS	12
					13-19			
	Orange to Yellow, wet, hard, Silty CLAY (CL)		22.0'	Caved in @ 20.0'				
			25	I	14	7	DS	17
					18-18			

ELEY.	DESCRIPTION OF MATERIALS (Classification)	STRATA DEPTH	DEPTH SCALE	SAMPLE				
				Cond.	Blows/6"	No.	Type	Rec.
	Orange to Yellow, wet, hard, Silty CLAY (CL)	29.5'			4 7-9	8	DS	17
	Wet, Grey, very stiff to hard, Silty CLAY with Lignite (CL)		30	I				
					12 20-23	9	DS	18
		40.0'		I	6 9-12	10	DS	17
	Test Boring Terminated @ 40.0'		40					
			45					
			50					

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WALSH
DONOHUE
CONSTRUCTION COMPANY

2101 WILCOXSON AVENUE N.W.
WASHINGTON, D.C. 20007
(202) 332-0880

A DIVISION OF THE DONOHUE COMPANIES, INC.

CLAS RIGGS OWENS & RAMOS
ARCHITECTS
PLANNERS

1000 E. 18th Ave. Suite 1015, Denver, CO 80202

UNIVERSITY OF MARYLAND DEPARTMENT OF PHYSICAL PLANT	APPROVAL	DATE
<i>[Signature]</i>	<i>[Signature]</i>	<i>4/16/64</i>
DIRECTOR AND RANCH SERVICES DATE		
<i>[Signature]</i>	<i>[Signature]</i>	<i>4/16/64</i>
PROJECT ARCHIVED		DATE

[illegible]

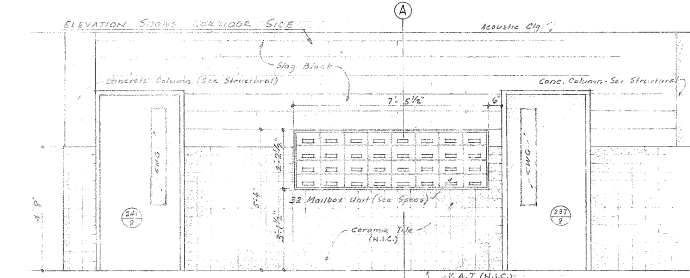
PARKING GARAGE LOT BB
UNIVERSITY OF MARYLAND
COLLEGE PARK, 20742

DATE
AUGUST 27, 1986
PROJECT NO
E-670267

BORINGS AND LOGS
INDEPENDENT TESTING LABORATORIES
DATED JULY 1986

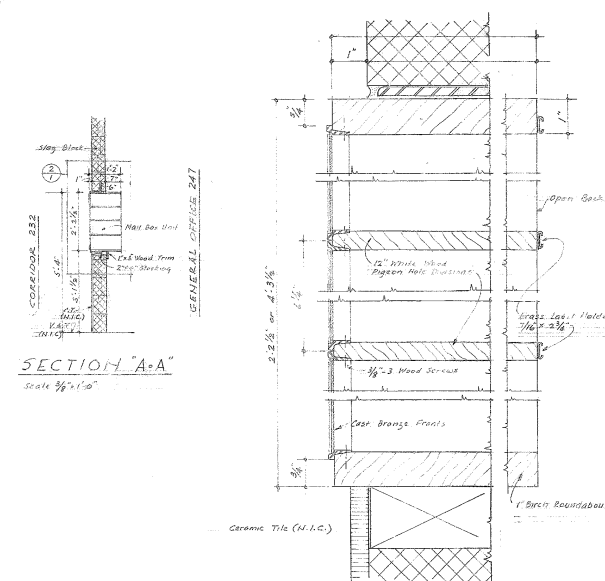
BORING DATA

INFORMATION TAKEN FROM TEST BORING REPORT, FOUNDATION TEST SERVICE, INC.
WASHINGTON D.C. DWG'S A-2222-1 & A-222-2 DATED: JAN. 3, 1963

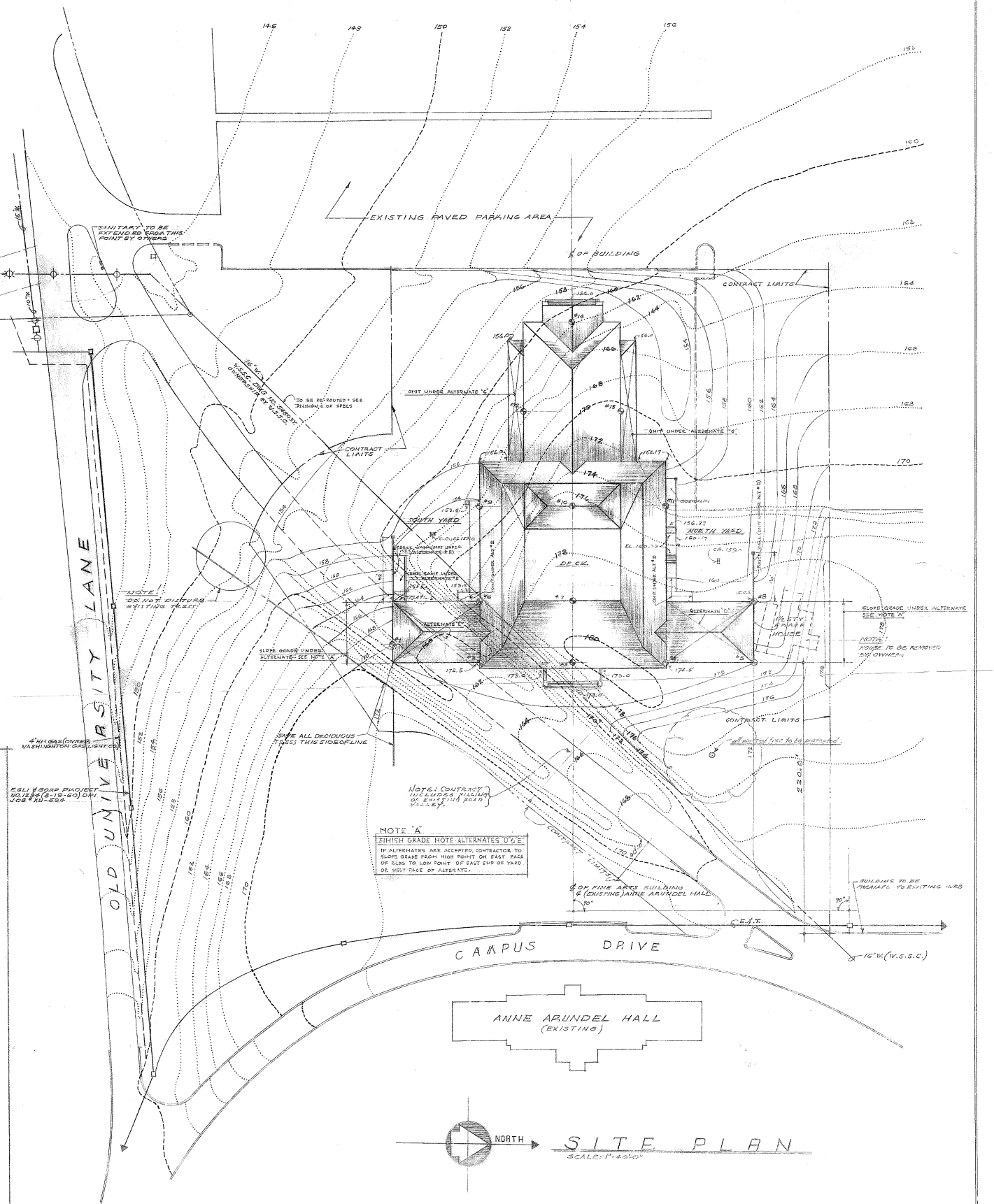
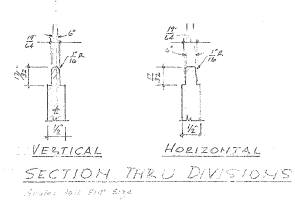


Hand-drawn architectural floor plan of a room, labeled 'B' in a circle. The plan shows a rectangular room with a door on the right side. The door is labeled 'DOOR' and has a small circle with '101' inside. The room has a grid of 10x10 units. Dimensions are given: 10'0" by 10'0". The door is 3'0" wide. The room is labeled 'Acoustic Tile' on the top and right walls. A 'Sling Block' is indicated on the top wall. The plan is dated 'MAY 1960' and includes the text 'Floor & Slat System' and '10'0" by 10'0"'. The plan is oriented with 'N' at the top.

MAILBOX - DETAILS.



2 SECTION
Scale: Half Full Size



NOTE:
DRAWINGS FOR CONSTRUCTION OF PROJECT
CONSISTS OF THE FOLLOWING:

ARCHITECTURAL:	DRAWINGS NO. 1 THRU 28 INCL.
STRUCTURAL:	DRAWINGS NO. 5-1 THRU 5-12 INCL.
MECHANICAL:	DRAWINGS NO. M-1 THRU M-15 INCL.
ELECTRICAL:	DRAWINGS NO. E-1 THRU E-14 INCL.

REVISÉ: JUNE 24, 1963

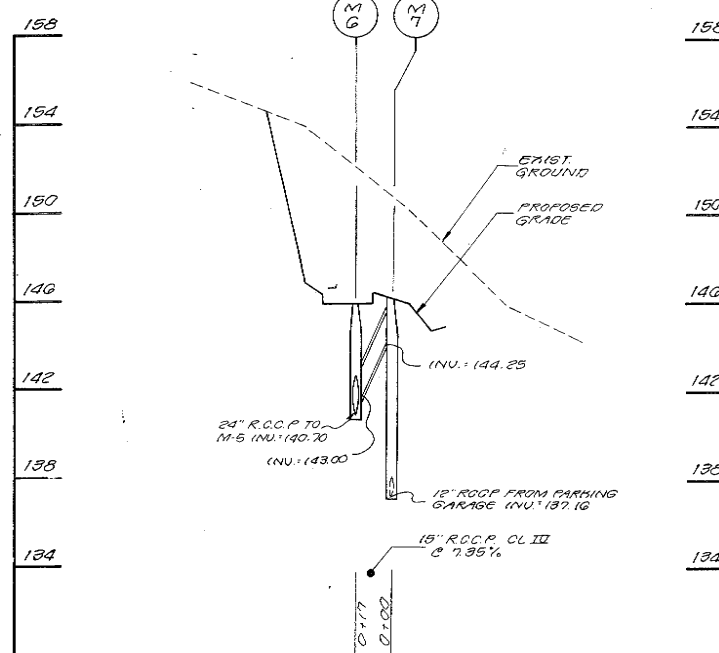
SITE PLAN

FINE.....ARTS.....BUILDING
UNIVERSITY...OF...MARYLAND
College Park.....Newland
RACE'S and PHELPS.....PHOTOGRAPHS
10 East Mulberry Street, Baltimore, Md.

ARCHIVES
 Building 141 Inventory # 0092

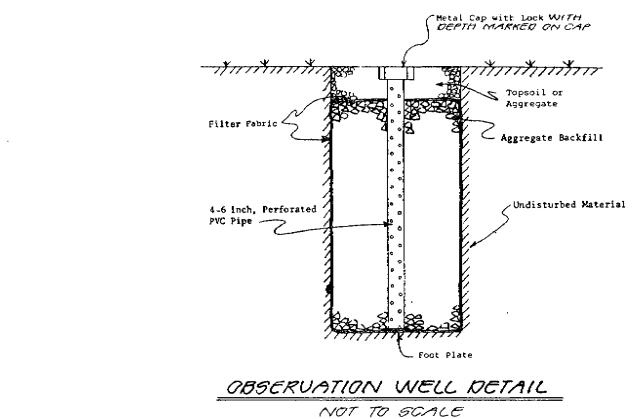
 141-0092

Department of Public
Improvements Project
U-604
Architect Comm. 362
Drawing

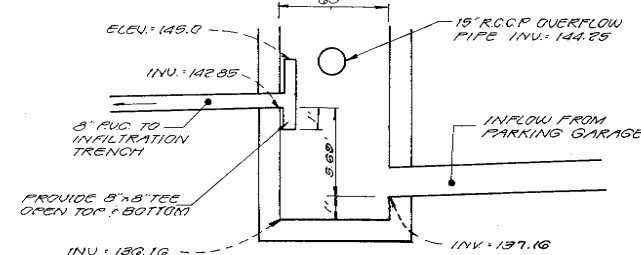


PROFILE THROUGH S.W.M.
OVERFLOW PIPE

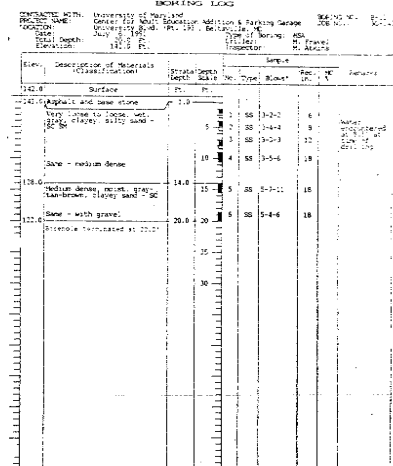
SCALE: 1" = 40' HORIZ.
1" = 4' VERT.



OBSERVATION WELL DETAIL
NOT TO SCALE



M-7 DETAIL
NOT TO SCALE

[illegible]

CONSTRUCTION SPECIFICATIONS

I. TIMING

A DRY WELL SHALL NOT BE CONSTRUCTED OR PLACED IN SERVICE UNTIL ALL OF THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED AND APPROVED BY THE RESPONSIBLE INSPECTOR.

II. DRY WELL PREPARATION

EXCAVATE THE DRY WELL TO THE DESIGN DIMENSIONS. EXCAVATED MATERIALS SHALL BE PLACED AWAY FROM THE EXCAVATED SITES TO ENHANCE WALL STABILITY. LARGE TREE ROOTS SHALL BE TRIMMED FLUSH WITH THE SURFACE ORDER TO PREVENT PUNCTURING OR TEARING OF THE LINER. EXCESSIVE SILTATION REQUIREMENTS PROCEDURES. THE SIDE WALLS OF THE DRY WELL SHALL BE ROUGHENED WHEN SHEARED AND SEALED BY HEAVY EQUIPMENT.

III. FABRIC LAYOUT

THE FILTER FABRIC ROLL SHALL BE CUT TO THE PROPER WIDTH PRIOR TO INSTALLATION. THE CUT WIDTH MUST INCLUDE SUFFICIENT MATERIAL TO CONFORM TO WALL PERIMETER IRREGULARITIES AND FOR A 6-INCH MINIMUM OVERLAP. PLACE THE FABRIC OVER THE EXCAVATION SURFACE TO PROVIDE A SUFFICIENT LENGTH TO ALLOW PLACEMENT OF THE FABRIC BOWN INTO THE WELL. STONES OR OTHER ANCHORING OBJECTS SHOULD BE PLACED ON THE INSIDE OF THE EDGE OF THE WELL TO KEEP THE LINED WALL OPEN DURING WINDY PERIODS. WHEN OVERLAPS ARE REQUIRED BETWEEN ROLLS, THE UP-STREAM ROLL SHALL LAP A MINIMUM OF 2 FEET OVER THE DOWNSTREAM ROLL. REFER TO THE DESIGN FOR A SUGGESTED EFFECT. THE OVERLAP ENSURES FABRIC CONTINUITY OF THE FABRIC CONFORMS TO THE EXCAVATION SURFACE DURING AGGREGATE PLACEMENT AND COMPACTION.

IV. AGGREGATE PLACEMENT AND COMPACTION

DRAINAGE AGGREGATE SHALL BE PLACED IN LIFTS AND COMPACTED USING PLATE COMPACTORS. AS A RULE OF THUMB, A MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES IS RECOMMENDED. THE COMPACTION PROCESS ENSURES FABRIC CONFORMS TO THE EXCAVATION SURFACE, THEREBY REDUCING THE POTENTIAL FOR SOIL PIPING AND FABRIC CLOGGING.

V. OVERLAPPING AND COVERING

FOLLOWING AGGREGATE PLACEMENT, THE FABRIC PREVIOUSLY MENTIONED BY STONES SHOULD BE PLACED OVER THE AGGREGATE TO FORM A 6 INCH NOMINAL LONGITUDINAL LAP. THE DESIRED FILL SOIL SHOULD BE PLACED OVER THE LAP AT SUFFICIENT INTERVALS TO MAINTAIN THE LAP DURING SUBSEQUENT BACKFILLING.

VI. CONTAMINATION

CARE SHALL BE EXERCISED TO PREVENT NATURAL OR FILL SOILS FROM INTERMIXING WITH THE DRAINAGE AGGREGATE. ALL CONTAMINATED AGGREGATE SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED AGGREGATE.

VII. VOIDS BEHIND FABRIC

VOIDS CAN BE CREATED BETWEEN THE FABRIC AND EXCAVATION SITES AND SHOULD BE AVOIDED. REMOVING BOUNCES OR OTHER OBSTACLES FROM THE TRENCH WALLS IS ONE SOURCE OF SUCH VOIDS. NATURAL SOILS SHOULD BE PLACED IN THESE VOIDS AT THE MOST CONVENIENT TIME DURING CONSTRUCTION TO ENSURE FABRIC CONFORMITY TO THE EXCAVATION SITES, SOIL PIPING, FABRIC CLOGGING, AND POSSIBLE SURFACE SUBSIDENCE WILL BE AVOIDED BY THIS REMEDIAL PROCESS.

VIII. UNSTABLE EXCAVATION SITES

VERTICALLY EXCAVATED TRENCH WALLS MAY BE DIFFICULT TO MAINTAIN IN AREAS WHERE THE SOIL MOISTURE IS HIGH OR WHERE SOFT CONVECTIVE OR COMEONLESS SOILS PREDOMINATE. THESE CONDITIONS MAY REQUIRE LATERAL BRACING OF THE FABRIC SLOPES TO MAINTAIN STABILITY; TRAPEZOIDAL RATHER THAN RECTANGULAR CROSS SECTIONS MAY RESULT.

IX. FOUNDATION PROTECTION

DRY WELLS 3 OR MORE FEET DEEP SHALL BE LOCATED AT LEAST 10 FEET DOWN GRADIENT FROM FOUNDATION WALLS.

X. OBSERVATION WELL

AN OBSERVATION WELL, AS DESCRIBED IN SUBSECTION 3.4.4.8 AND FIGURES 3-5, WILL BE PROVIDED. THE DEPTH OF THE WELL, AT THE TIME OF INSTALLATION, WILL BE CLEARLY MARKED ON THE WELL CAP.

XI. FILTER CLOTH

FILTER CLOTH SHALL BE A WOVEN OR NONWOVEN FABRIC CONSISTING ONLY OF A CONTINUOUS CHAIN POLYMERIC FILAMENTS OR FIBERS OF POLYESTER, THE FABRIC SHALL BE CAPABLE TO COMPLY ENCLOSED CHEMICALS, HYDRO-CARBONS, MILDEW, OR ROE RESISTANT AND CONFORM TO THE FOLLOWING VALUES:

GRAB STRENGTH	= 120 LBS
GRAB ELONGATION	= 55%
MILLEN BUST STRENGTH	= 210 PSI
PUNCTURE STRENGTH	= 70 LBS
EQUIV. OPENING SIZE	= 100

XII. EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED, AS SHOWN ON CONSTRUCTION PLANS.

XIII. FENCE

THOSE FACILITIES WHICH ARE REQUIRED TO BE FENCED SHALL BE FENCES IN ACCORDANCE WITH THE STATE HIGHWAY ADMINISTRATION STANDARD DETAILS 101 AND 690.02. THE SPECIFICATIONS FOR A 6' HIGH FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6" LINE POSTS. THE GATE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SHM STANDARD DETAIL 692.01 WITH 42" FABRIC. THE FABRIC USED FOR THE FENCE AND GATE SHALL CONFORM TO AASHTO DESIGNATION M181-74.

Infiltration Rate

The soil of borings SWM-1 and SWM-3 is classified as Loamy Sand by the USDA Soil Textural Classification. The laboratory test results of the soil sample and estimated infiltration rate are summarized below:

Boring No.	USDA Textural Classification	Depth of Strata (ft.)	AASHTO Class.	Water Depth After 12 Hrs.	Minimum Infiltration Rate (inches/hour)
SWM-1	Loamy Sand	7.0	A-2-4 (0)	7.0"	2.41
SWM-2	Loamy Sand*	9.5	a	3.5**	2.41
SWM-3	Clay	15.0	*	DB	N/A
SWM-4	Loamy Sand	14.5	A-6 (0)	1.0	2.41


* Visual classification.
**Moist covered at 4.5'; water encountered at 17.0' during drilling.

APPLICANT: STV Group
21 Governors Court
Baltimore, MD 21207
(410)/ 944-9112

OWNER: University of Maryland
Administrative Services Building
Room 2113-R
College Park, MD 20742
(301)/

CONTRACTOR: Harkins Builders, Inc.
17301 Old Columbia Pike
Silver Spring, MD 20904
(301)/ 622-9600

ENGINEER: STV Group
21 Governors Court
Baltimore, MD 21207
(410) 944-9112



STV GROUP

Engineers • Surveyors

21 Governors Court
Baltimore, Maryland 21207
(301) 944-9112

STUDENT AND FACULTY SERVICES BUILDING & PARKING GARAGE
UNIVERSITY OF MARYLAND UNIVERSITY COLLEGE
COLLEGE PARK, MARYLAND

95% COMMENTS	7/27/92
% CD	5/12/92
ORD./OWNER COMMENTS	3/13/92
Date: 1/29/92 Comm. No. : Drawing No.: C-5	



Drainage Area Map and Boring Location Plan

BUILDING
PGUC
#347

UNIVERSITY OF MARYLAND SYSTEM	
APPROVAL	
USING AGENCY	DATE
ENGINEERING & ARCHITECTURAL SERVICES	DATE

[illegible]

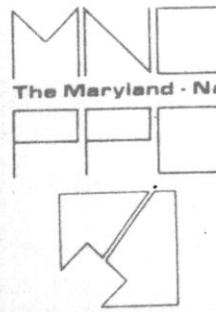
Project:		
S.W.M. Details		
Title:		
Scale: 1"=40'-0"	Wdg. no.	Proj. no. E-910056
Date:	Own. by:	Chk. by:
Engineering & Architectural Services		
The University of Maryland		College Park Campus

	COORD./OWNER COMMENTS 3/13/92						
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Date:	1/29/92						
Comm. No.:							
Drawing No.:	C-5						



Appendix D

Historic Data Riverdale Area



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FAX: (301) 699-8040
mterry@pgparks.com

Michael G. Terry, Jr., P.E.
ENGINEERING SUPERVISOR

PARK PLANNING &
DEVELOPMENT DIVISION
ENGINEERING, CONTRACT &
SURVEYING SECTION

PRINCE GEORGE'S COUNTY
DEPT. OF PARKS & RECREATION
8600 KENILWORTH AVE.
RIVERDALE, MD 20737-0707



14221-B Willard Road
Suite 100
Chantilly, Virginia 20151

CTI Project Name:

Anacostia River Park
Prince George's County, Maryland

CTI Project Number: 15G-322

Figure: Boring Location Plan

Figure Number: 4

Date: September 2007

Prepared By: C. Lynch

Scale: Not to Scale

RIVERDALE COMMUNITY PARK

NOTES FOR TEST BORING LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D2487-00)			SYMBOLS	
			GRAPHIC	LETTER
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 15% PASSING THE NO. 200 SIEVE)		GW
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GP
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)		SW
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SP
				SM
				SC
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILT OR CLAY ($<15\%$ RETAINED THE NO. 200 SIEVE)		ML
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CL
		SANDY OR GRAVELLY SILT OR CLAY ($>30\%$ RETAINED THE NO. 200 SIEVE)		OL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILT OR CLAY ($<15\%$ RETAINED THE NO. 200 SIEVE)		MH
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CH
		SANDY OR GRAVELLY SILT OR CLAY ($>30\%$ RETAINED THE NO. 200 SIEVE)		OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

ADDITIONAL DESIGNATION	DESCRIPTION		GRAPHIC SYMBOLS
	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATION	DESCRIPTION	"N" VALUE	
	PARTIALLY WEATHERED ROCK	LESS THAN 100/2" OR 50/1"	
	HIGHLY WEATHERED ROCK	50 TO 100/2" OR 50/1"	

COARSE GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF)
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	>50

FINE GRAINED SOILS (SILT AND CLAY)

CONSISTENCY	BPF
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	4 - 8
STIFF	8 - 15
VERY STIFF	15 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OR ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	
UPON COMPLETION OF DRILLING	
24 HOURS AFTER COMPLETION	

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.



CTI CONSULTANTS INC
14221-B Willard Road
Chantilly, Virginia 20151
Telephone: 703 803 6411
Fax: 703 803 8085

BORING NUMBER B-5

PAGE 1 OF 1

CLIENT The Maryland-National Capital Park and Planning Commission

PROJECT NAME Anacostia River Park

PROJECT NUMBER 15G-322

PROJECT LOCATION Prince George's County, Maryland

DATE STARTED 6/18/07 COMPLETED 6/18/07

GROUND ELEVATION 30 ft MSL AUGER SIZE 2 1/4 I.D.

DRILLING CONTRACTOR Recon Drilling

GROUND WATER LEVELS:

DRILLING METHOD Hollow Stem Augers

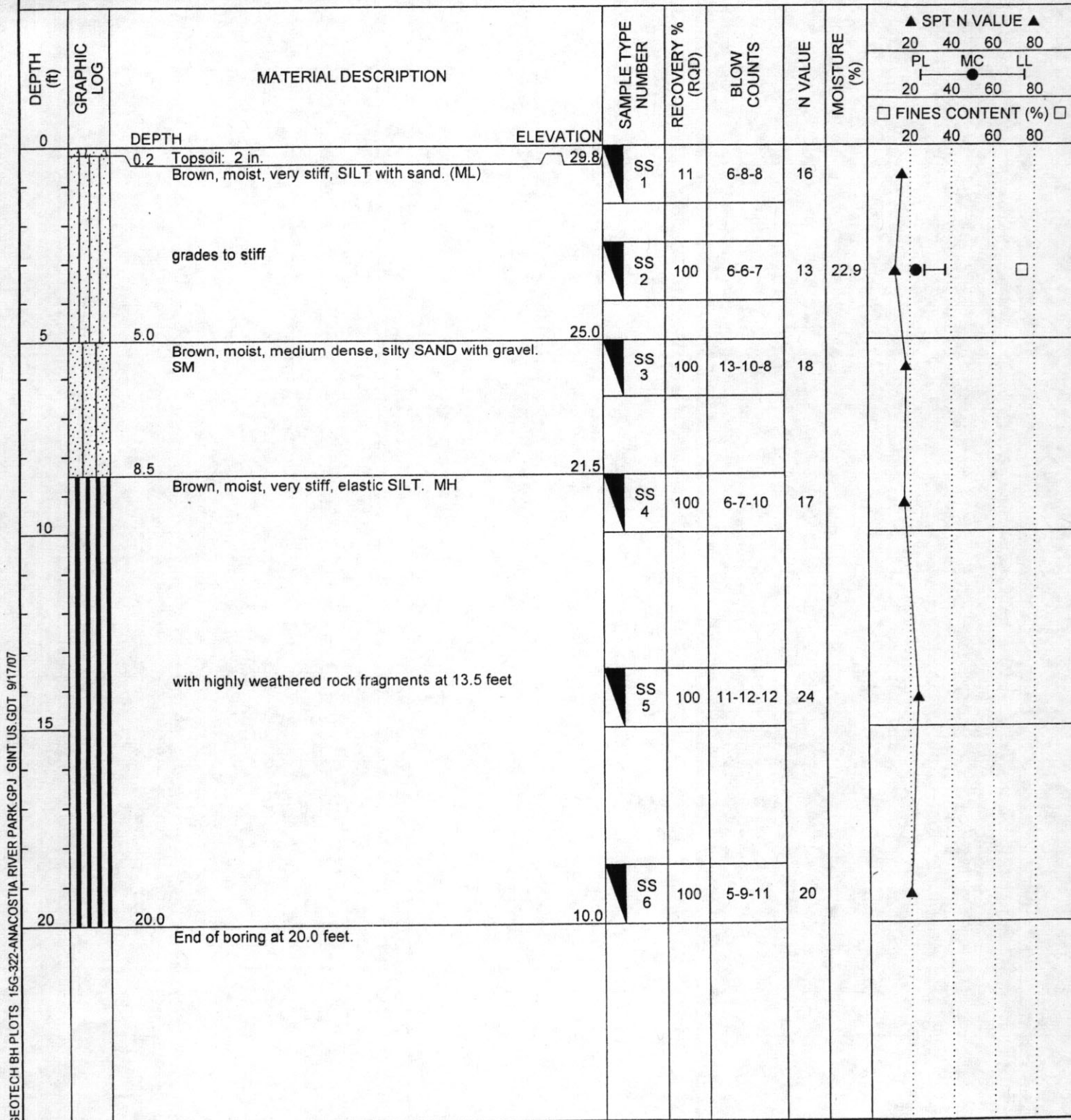
AT TIME OF DRILLING None

LOGGED BY W. Radas CHECKED BY C. Lynch

AT END OF DRILLING Dry

NOTES G.S.E. interpolated from topo info provided by Terraserver

AFTER DRILLING Dry





CTI CONSULTANTS INC
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Chantilly, Virginia 20151
Telephone: 703 803 6411
Fax: 703 803 8085

BORING NUMBER B-6

PAGE 1 OF 1

CLIENT The Maryland-National Capital Park and Planning Commission

PROJECT NAME Anacostia River Park

PROJECT NUMBER 15G-322

PROJECT LOCATION Prince George's County, Maryland

DATE STARTED 6/18/07 COMPLETED 6/18/07

GROUND ELEVATION 30 ft MSL AUGER SIZE 2 1/4 I.D.

DRILLING CONTRACTOR Recon Drilling

GROUND WATER LEVELS:

DRILLING METHOD Hollow Stem Augers

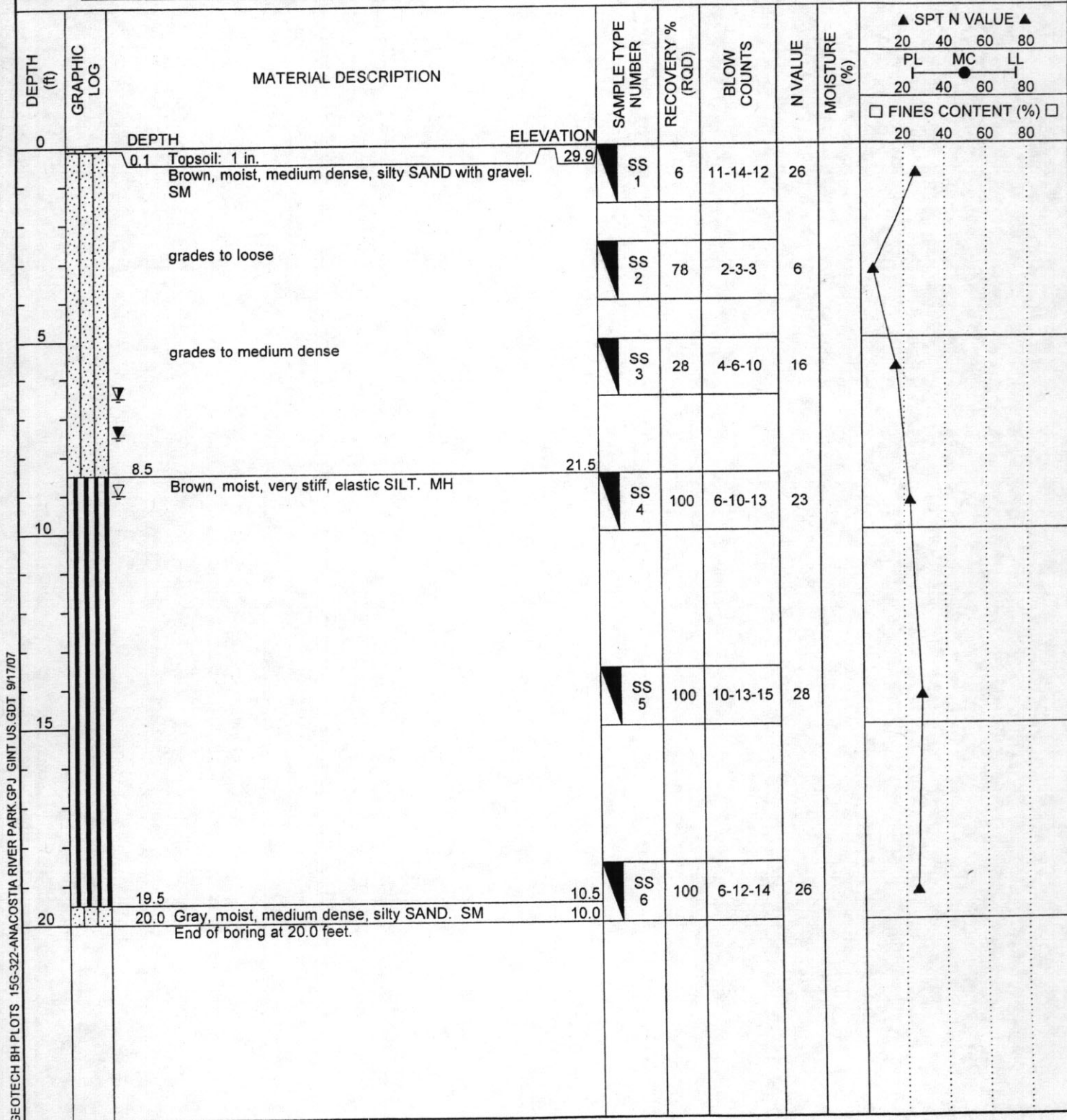
▽ AT TIME OF DRILLING 9.0 ft / Elev 21.0 ft

LOGGED BY W. Radas CHECKED BY C. Lynch

▽ AT END OF DRILLING 7.5 ft / Elev 22.5 ft

NOTES G.S.E. interpolated from topo info provided by Terraserver

▽ AFTER DRILLING 6.5 ft / Elev 23.5 ft





CTI CONSULTANTS INC
14221-B Willard Road
Chantilly, Virginia 20151
Telephone: 703 803 6411
Fax: 703 803 8085

BORING NUMBER B-7

PAGE 1 OF 1

CLIENT The Maryland-National Capital Park and Planning Commission

PROJECT NAME Anacostia River Park

PROJECT NUMBER 15G-322

PROJECT LOCATION Prince George's County, Maryland

DATE STARTED 6/18/07 COMPLETED 6/18/07

GROUND ELEVATION 30 ft MSL AUGER SIZE 2 1/4 I.D.

DRILLING CONTRACTOR Recon Drilling

GROUND WATER LEVELS:

DRILLING METHOD Hollow Stem Augers

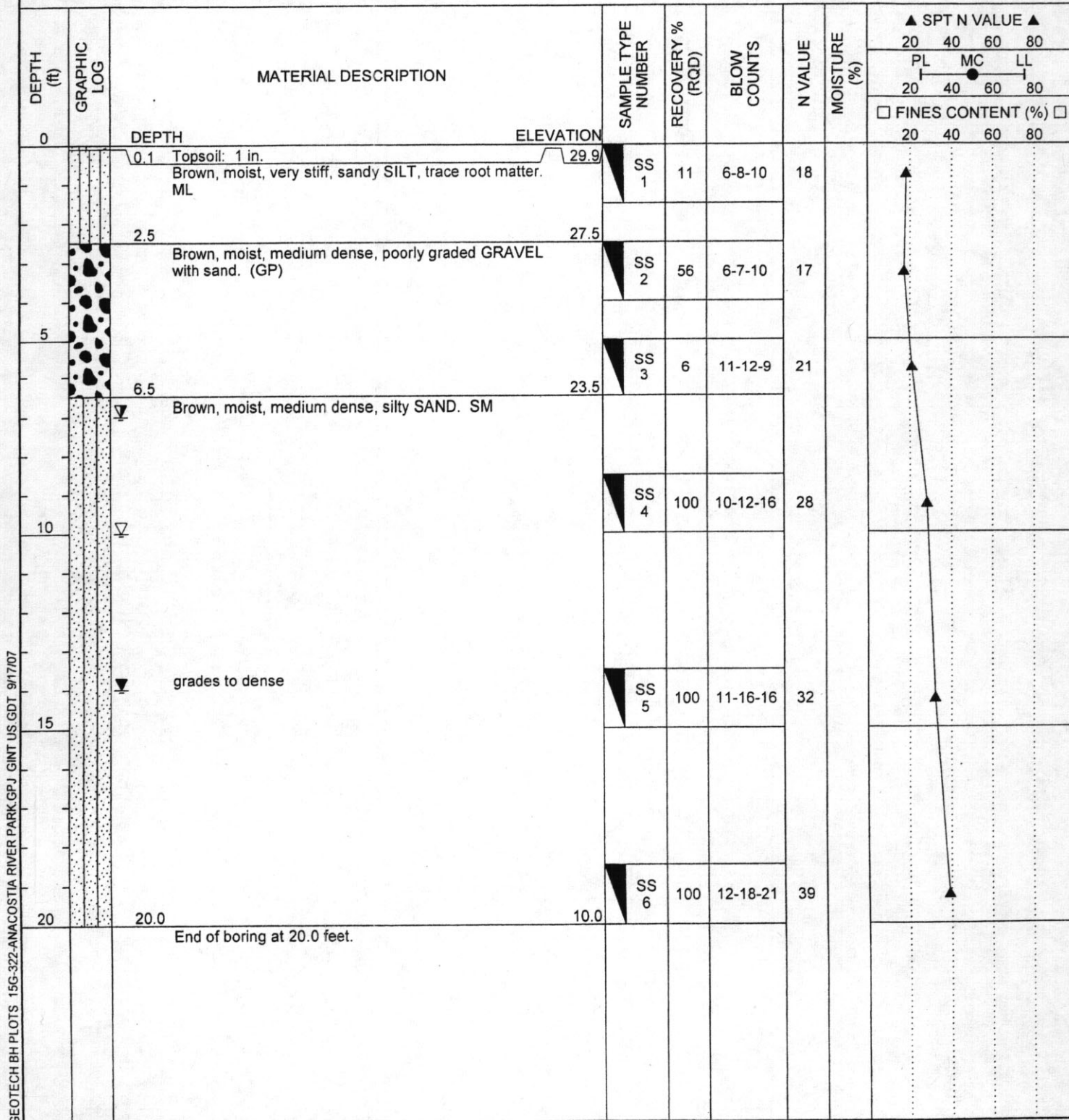
▽ AT TIME OF DRILLING 10.0 ft / Elev 20.0 ft

LOGGED BY W. Radas CHECKED BY C. Lynch

▽ AT END OF DRILLING 14.0 ft / Elev 16.0 ft

NOTES G.S.E. interpolated from topo info provided by Terraserver

▽ AFTER DRILLING 7.0 ft / Elev 23.0 ft





CTI CONSULTANTS INC
14221-B Willard Road
Chantilly, Virginia 20151
Telephone: 703 803 6411
Fax: 703 803 8085

BORING NUMBER B-8

PAGE 1 OF 1

CLIENT The Maryland-National Capital Park and Planning Commission

PROJECT NAME Anacostia River Park

PROJECT NUMBER 15G-322

PROJECT LOCATION Prince George's County, Maryland

DATE STARTED 6/18/07 COMPLETED 6/18/07

GROUND ELEVATION 30 ft MSL AUGER SIZE 2 1/4 I.D.

DRILLING CONTRACTOR Recon Drilling

GROUND WATER LEVELS:

DRILLING METHOD Hollow Stem Augers

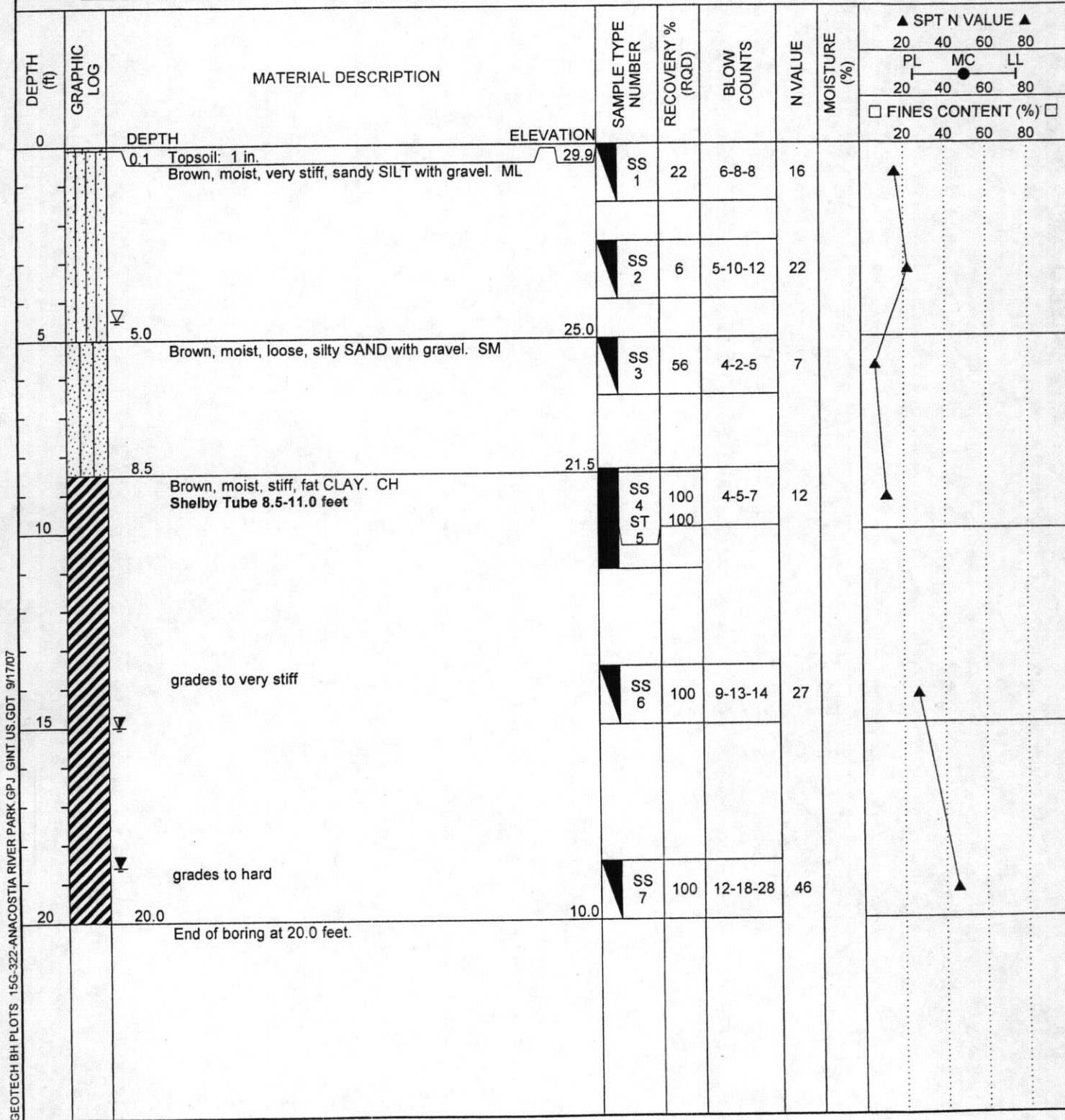
▽ AT TIME OF DRILLING 4.5 ft / Elev 25.5 ft

LOGGED BY W. Radas CHECKED BY C. Lynch

▽ AT END OF DRILLING 18.6 ft / Elev 11.4 ft

NOTES G.S.E. interpolated from topo info provided by Terraserver

▽ AFTER DRILLING 15.0 ft / Elev 15.0 ft



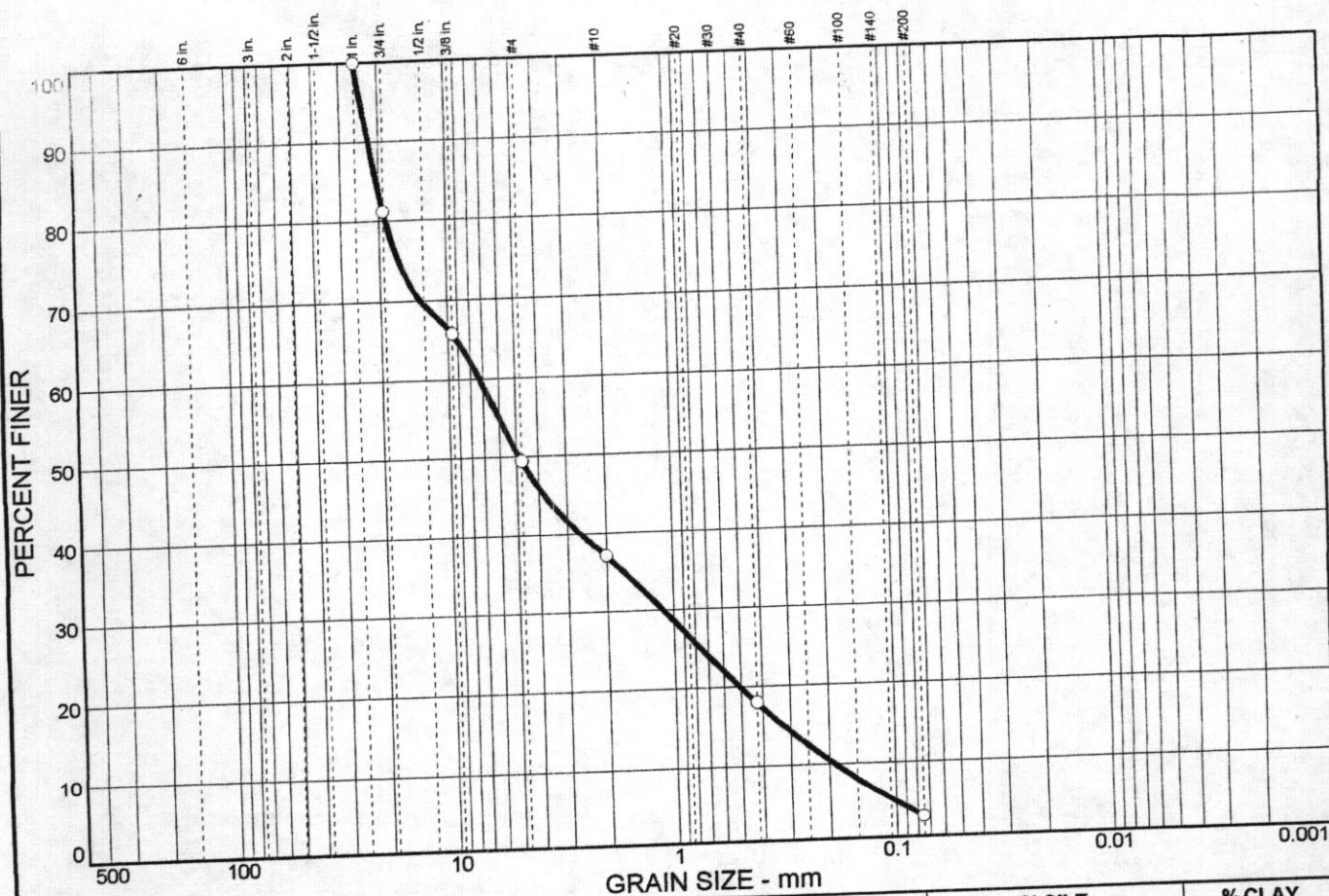
Grain size distribution curve for a soil sample. The graph plots Percent Finer (0 to 100) against Grain Size in mm (logarithmic scale from 500 to 0.075). The curve shows a soil with approximately 78% passing the #200 sieve (0.075 mm).

Grain Size (mm)	Percent Finer (%)
60	100
30	100
15	100
7.5	100
3.75	100
2.0	98
1.0	96
0.6	95
0.425	94
0.25	93
0.15	88
0.075	78

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.375 in.	94.3		
#4	92.6		
#10	91.4		
#40	85.8		
#200	74.4		

Initial Moisture: 22.9 %

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	50.6	46.7	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	81.2		
.375 in.	65.7		
#4	49.4		
#10	37.1		
#40	18.0		
#200	2.7		

* (no specification provided)

Sample No.: 2 (S-3)
Location: B-7

Source of Sample: On Site

Date: 06-27-07
Elev./Depth: 5.0

CTI Consultants, Inc.

Client: NNCPPC
Project: Walker Mill Regional Park & Anacostia River Park.

Project No: 15G-322

Initial Moisture: 3.9 %

Soil Description

Light brown poorly graded GRAVEL with sand.

Atterberg Limits

PL= NP

LL= ND

PI= NP

Coefficients

D₈₅= 20.4

D₆₀= 7.26

D₅₀= 4.88

D₃₀= 1.12

D₁₅= 0.321

D₁₀= 0.188

C_u= 38.63

C_c= 0.91

Classification

USCS= GP

AASHTO=

Remarks

Test specifications: ASTM D422, ASTM D2487, ASTM D4318, ASTM D2216.

INDEX OF SHEETS

SHEET 1	TITLE SHEET
SHEET 2	TYPICAL SECTIONS
SHEET 3	TYPICAL SECTIONS & CURB DETAILS
SHEET 4	DETAILS
SHEET 5	DRAINAGE DETAILS
SHEET 6	PLAN & PROFILE STA.10+00 TO STA.24+20
SHEET 7	PLAN & PROFILE STA.24+20 TO STA.35+00
SHEET 8	PLAN & PROFILE STA.35+00 TO STA.51+00
SHEET 9	PLAN STA.51+00 TO STA.66+00
SHEET 10	PLAN STA.66+00 TO STA.82+00
SHEET 11	PROFILE STA.51+00 TO STA.82+00
SHEET 12	PLAN & PROFILE STA.82+00 TO STA.95+00
SHEET 13	SPUR PROFILES
SHEET 14	STAKEOUT DATA STA.13+ TO STA.21+
SHEET 15	STAKEOUT DATA STA.27+ TO STA.36+50
SHEET 16	STAKEOUT DATA STA.36+50 TO STA.44+
SHEET 17	STAKEOUT DATA STA.63+ TO STA.73+50 & SPUR PROFILES
SHEET 18	STAKEOUT DATA STA.73+50 TO STA.90+
SHEET 19	REFERENCE TIES
SHEET 20	STORM DRAINAGE PROFILES
SHEET 21	STORM DRAINAGE PROFILES
SHEET 22	5'-7"x4'-0" BOX CULVERT AT STA.17+30 PLAN & ELEVATION
SHEET 23	5'-7"x4'-0" BOX CULVERT AT STA.17+30 DETAILS
SHEET 24	LOCATION OF SLOPE PROTECTION AT B&O BRIDGE
SHEET 25	STAIR DETAILS AT B & O BRIDGE
SHEET 26	RETAINING WALL STA.28+54.62 TO STA.32+98.62 (E.B.L.) PLAN & ELEVATION
SHEET 27	RETAINING WALL STA.28+54.62 TO STA.32+98.62 (E.B.L.) PLAN & ELEVATION
SHEET 28	RETAINING WALL STA.28+54.62 TO STA.32+98.62 (E.B.L.) DETAILS
SHEET 29	RETAINING WALL STA.31+18.49 TO STA.35+44.54 (W.B.L.) PLAN & ELEVATION
SHEET 30	RETAINING WALL STA.31+18.49 TO STA.35+44.54 (W.B.L.) PLAN & ELEVATION
SHEET 31	RETAINING WALL STA.31+18.49 TO STA.35+44.54 (W.B.L.) DETAILS
SHEET 32	RETAINING WALLS BORING LOGS
SHEET 33	17'-0"x5'-0" BOX CULVERT AT STA.37+14 PLAN & ELEVATION
SHEET 34	17'-0"x5'-0" BOX CULVERT AT STA.37+14 DETAILS
SHEET 35	20'-0"x6'-0" BOX CULVERT AT STA.48+00 PLAN & ELEVATION
SHEET 36	20'-0"x6'-0" BOX CULVERT AT STA.48+00 DETAILS
SHEET 37	SUMMARY OF QUANTITIES
SHEET 38	SUMMARY OF QUANTITIES
SHEET 39	SUMMARY OF QUANTITIES
SHEET 40	SUMMARY OF QUANTITIES
SHEET 41	SUMMARY OF QUANTITIES

STATE OF MARYLAND STATE ROADS COMMISSION

PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

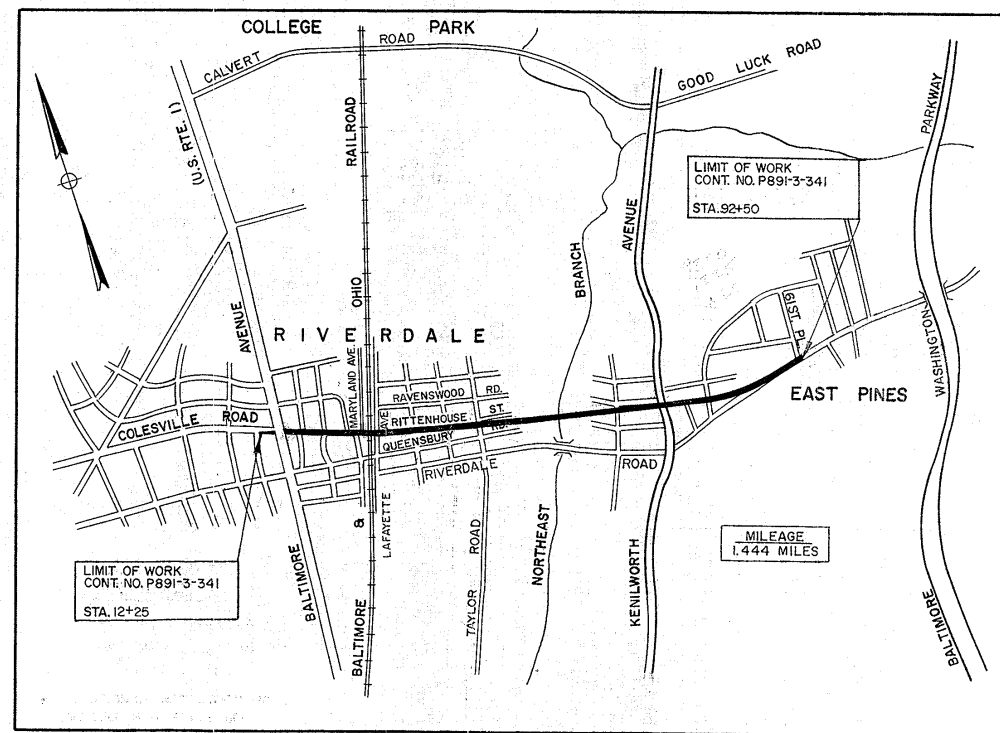
FEDERAL AID PROJECT NO.

EAST WEST HIGHWAY EXTENSION (MD. RTE. 410)

PRINCE GEORGES COUNTY

CONTRACT NO. P-891-3-341

SCALE PLAN: 1 IN. = 50 FT.
PROFILE: HOR. 1 IN. = 50 FT.; VERT. 1 IN. = 10 FT.



CONVENTIONAL SIGNS

STATE AND NATIONAL LINE	=====	CULVERTS	=====
COUNTY LINE	-----	RETAINING WALL	=====
CITY OR VILLAGE	-----	DROP INLET	=====
GUARD RAIL	=====	TROLLEY POLE	=====
FENCE LINE	=====	POWER POLE	=====
UNFENCED PROPERTY	-----	TELEPHONE OR TELEGRAPH POLE	=====
RIGHT OF WAY LINE	-----	MARSH	=====
TRAVELED WAY	=====	HEDGE	=====
RAILROADS	=====		
BASE OR SURVEY LINE	-----	GROUND ELEVATION	DATUM LINE 174.6
		GRADE ELEVATION	DATUM LINE 210.2

FOR DETAILS OF CULVERTS, ETC. SEE STANDARD SHEET.
STATE SPECIFICATIONS AND STANDARD PLANS ON FILE IN BUREAU OF PUBLIC ROADS.

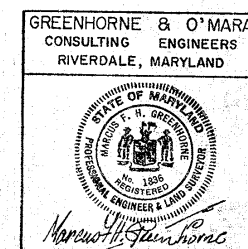
LOCATION PLAN

SCALE: 1" = 0.25 MILES

DESIGN SPEED 40MPH.

TRAFFIC DATA

WEST OF KENILWORTH AVE.		1963	1984
ADT		12250	29470
DHV		8% OF ADT	8% OF ADT
DIRECTIONAL DISTRIBUTION		63%	63%
% TRUCKS-ADT		5	5
% TRUCKS-DHV		3	3
EAST OF KENILWORTH AVE.		1963	1985
ADT		18,000	44,500
DHV		9% OF ADT	9% OF ADT
DIRECTIONAL DISTRIBUTION		66%	66%
% TRUCKS-ADT		5	5
% TRUCKS-DHV		3	3



SURVEY BOOKS

BOOK NO.	TRaverse, TOPO & CROSS SECTIONS
15478	
BOOK NO.	CENTER LINE
15623	
BOOK NO.	CROSS SECTIONS
15624	
BOOK NO.	TRaverse & TOPO
15884	
BOOK NO.	TRaverse & TOPO
15889	
BOOK NO.	CROSS SECTIONS
15890	
BOOK NO.	TRaverse & TOPO
15891	
BOOK NO.	CROSS SECTIONS
15892	
BOOK NO.	TRaverse, TOPO & CROSS SECTIONS
16061	

SOIL LEGEND

	A-3, SAND - NON PLASTIC		A-4-7, CLAY SILT
	A-2, SAND & FINES		A-5, MICACEOUS SILT, AND/OR DECOMPOSED ROCK
	A-2-4, SILTY SAND		A-7, CLAY
	A-2-7, CLAY SAND		A-7-2, SANDY CLAY
	A-4, SILT		A-7-4, SILTY CLAY
	A-4-2, SANDY SILT		A-6, COLLOIDAL CLAY



PLAN LOCATION OF SOIL BORINGS
PROFILE VERTICAL SCALE = 1" = 10'

IN PLACE DENSITY (DEPTH)
DRY DENSITY - MOISTURE (DATE)

ABBREVIATIONS:

L.L. - LIQUID LIMIT, P.I. - PLASTICITY INDEX, N.P. - NON PLASTIC,
MAX. DEN. - MAXIMUM DENSITY, OPT. MOIST. - OPTIMUM MOISTURE

UNLESS OTHERWISE NOTED ON PLANS, ALL SOIL SURVEY BORINGS FOR ROADWAY CONSTRUCTION WERE LEFT OPEN FOR 24 HRS. WITH NO EXCESS MOISTURE OR FREE WATER ENCOUNTERED DURING TIME OF SOIL SURVEY (10-64 TO 1-65). BORING DATA FOR STRUCTURES IS INDICATED ON RESPECTIVE PLAN SHEETS.

RIGHT OF WAY LINES SHOWN ON THESE PLANS DO NOT INCLUDE EASEMENT, THEY ARE FOR ASSISTANCE IN INTERPRETING THE PLANS, THEY ARE NOT OFFICIAL. FOR OFFICIAL FEE RIGHT OF WAY AND EASEMENT INFORMATION, SEE APPROPRIATE RIGHT OF WAY PLAT OR PLATS.

REVIEWED AND APPROVAL RECOMMENDED
A.L. Smith 6/22/66
CHIEF, BUREAU OF BRIDGE DESIGN

REVIEWED AND APPROVAL RECOMMENDED
Hugh H. Downs 6-22-66
CHIEF, BUREAU OF HIGHWAY DESIGN

APPROVAL RECOMMENDED
C.A. Goldstein 6/22/66
ASSIST. CHIEF ENGINEER-DESIGN

APPROVED
D.H. Fisher 6/22/66
CHIEF ENGINEER, STATE ROADS COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

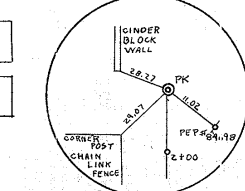
APPROVED

DIVISION ENGINEER _____ DATE _____

REMOVE EX. INLETS & MANHOLES AT STA. 70+45, 95' LT. 75+43, 35' LT. 70+80, 61' LT. 75+51, 51' LT. 70+90, 34' LT. 75+76, 81' LT. REMOVE EX. PIPE CULVERTS NO LONGER REQUIRED IN PROPOSED DRAINAGE SYSTEM

EAST WEST HIGHWAY
TYPICAL SECTIONS "D" SHEET 2
PROFILE SHEET 11
STAKEOUT DATA, SUPERELEVATION
SCHEDULE AND ENTRANCE
& WALK SCHEDULE
SHEETS 17 & 18

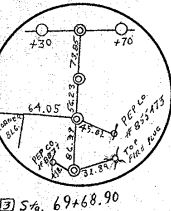
DRAINAGE PROFILES
SHEET 21
REFERENCE TIES
SHEET 19



SPUR LT. & STA. 76+64.30
STA. 2+50 58' Ave.
68TH AVENUE LT.
TYPICAL SECTION E, SHEET 3
PROFILE SHEET 17
BIT. CURB STA. 0+00 TO STA. 1+50 LT. & RT.
SRC. PLATE CU-6

STRUCTURE SCHEDULE				
NO.	STATION	OFFSET	TYPE	TOP ELEVATION
114	70+89	34' LT.	SHALLOW MANHOLE	48.56
72	71+18	4' RT.	S COMB. INLET	48.21
70	73+15	47' LT.	S COMB. INLET	48.24
71	73+60	8' RT.	E COMB. INLET	48.97
112	75+44	13' RT.	SPECIAL MANHOLE	48.21
111	75+75	78' LT.	SPECIAL MANHOLE	50.5
69	77+77	13' LT.	E COMB. INLET	50.57
68	78+15	13' RT.	S COMB. INLET	50.57
64	78+40	8' RT.	H INLET	52.3
63	78+40	8' RT.	S COMB. INLET	58.88
62	79+00	47' LT.	S COMB. INLET	61.22

INVERT ELEVATIONS SHOWN ON DRAINAGE
PROFILES SHEET 21



QUINTANA STREET

REMOVE EX. TOP OF SPECIAL TYPE "H" COMB.
INLET AT STA. 215+45 LT.
PLACE NEW PRECAST CONC. HEAD IN ITS PLACE

PATTERSON ROAD
USE PAVEMENT IN TYP. SECTION E SHEET 2
SPECIAL CURB & GUTTER, DETAIL J SHEET 3

CURVE DATA A & B
A = 3' 22' 00"
B = 450.00'
T = 36.86'
L = 73.57'

KENILWORTH AVENUE
TYPICAL SECTIONS H & N SHEET 3
REFER TO SHEET 17

CONNECT EX. 24" PIPE
TO MH. #114

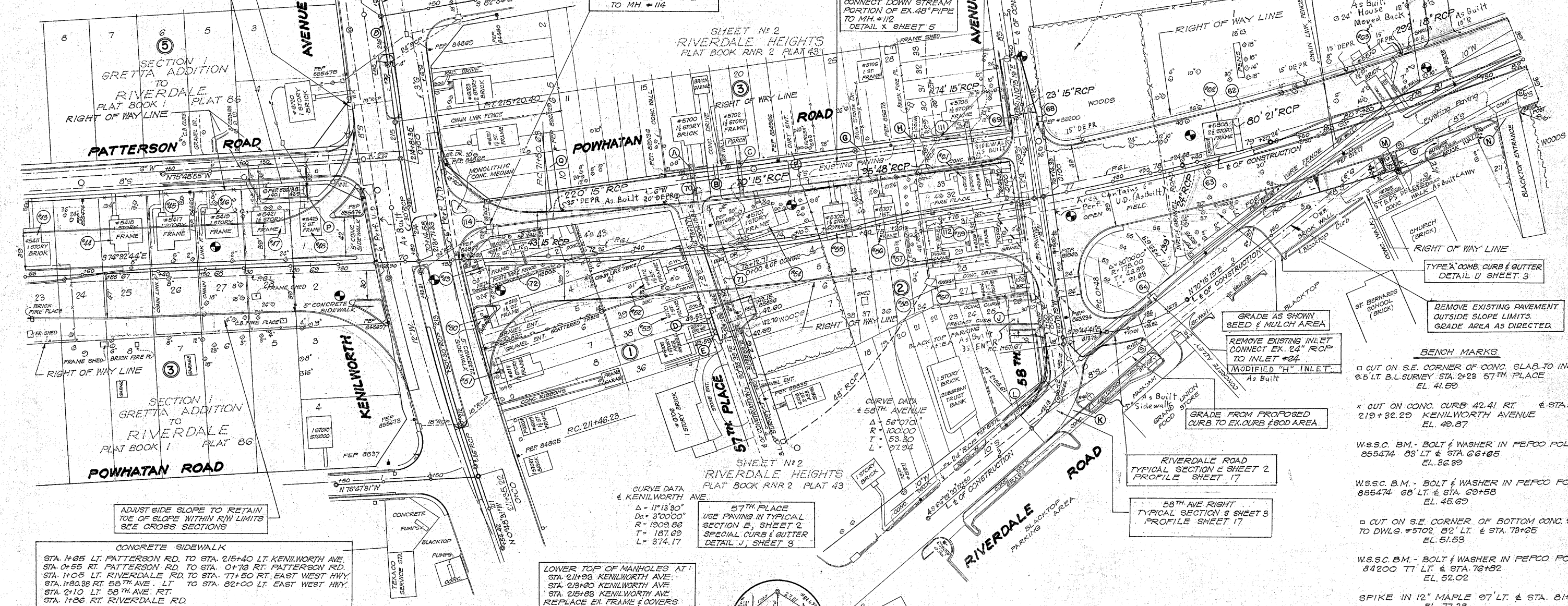
CURVE DATA
OF CONSTRUCTION
Δ = 23° 35' 30"
Dc = 1' 45' 00"
R = 3274.05
T = 683.74
L = 1348.10
S/E = 0.020

REMOVE EX. INLET AT STA. 75+75, 78' LT.
AND CONSTRUCT MANHOLE #111 CONNECTING
UPSTREAM EX. 48" PIPE
DETAIL W, SHEET 5

REMOVE EXISTING PAVEMENT
AND CURB & GUTTER
GRADE AREA AS DIRECTED
OUTSIDE SLOPE LIMITS

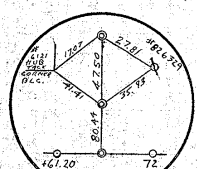
CONNECT DOWN STREAM
PORTION OF EX. 48" PIPE
TO MH. #112
DETAIL X SHEET 5

SHEET #2
RIVERDALE HEIGHTS
PLAT BOOK RNR 2 PLAT 43



CURVE DATA
OF KENILWORTH AVE.
Δ = 11° 13' 30"
Dc = 3' 00' 00"
R = 1909.86
T = 187.69
L = 374.17

LOWER TOP OF MANHOLES AT:
STA. 211+98 KENILWORTH AVE.
STA. 213+60 KENILWORTH AVE.
STA. 215+83 KENILWORTH AVE.
REPLACE EX. FRAME & COVERS
WITH NO. SRC. TYPE "A" FRAME & COVERS



P.C. 71+50.63

CONCRETE SIDEWALK

STA. 1+65 LT. PATTERSON RD. TO STA. 215+40 LT. KENILWORTH AVE.
STA. 0+55 RT. PATTERSON RD. TO STA. 0+78 RT. PATTERSON RD.
STA. 1+05 LT. RIVERDALE RD. TO STA. 11+50 RT. EAST WEST HWY.
STA. 1+80.38 RT. 58TH AVE. LT. TO STA. 82+00 LT. EAST WEST HWY.
STA. 2+10 LT. 58TH AVE. RT.
STA. 1+06 RT. RIVERDALE RD.

G' TOPSOIL
STA. 66+00 TO STA. 69+47 LT. & RT.
STA. 70+00 TO STA. 76+21.
STA. 80+ TO STA. 82+00 LT.
STA. 80+ TO STA. 81+ RT.

G' ROOT MAT
STA. 77+ TO STA. 80+ LT. & RT.
STA. 81+ TO STA. 82+00 RT.

SCALE PLAN: 1 IN. = 50 FT.
PROFILE: HOR. 1 IN. = 50 FT.; VERT. 1 IN. = 10 FT.

RIGHT OF WAY PLATS No. 31249, 31250 & 31251

RIVERDALE ROAD
TYPICAL SECTION E SHEET 2
PROFILE SHEET 17

58TH AVE. RIGHT
TYPICAL SECTION S SHEET 3
PROFILE SHEET 17

GRADE FROM PROPOSED
CURB TO EX. CURB #800 AREA.

REMOVE EXISTING INLET
CONNECT EX. 24" RCP
TO INLET #64
MODIFIED "H" INLET.
As Built

GRADE AS SHOWN
SEED & MULCH AREA

BENCH MARKS

□ CUT ON S.E. CORNER OF CONC. SLAB TO INLET
9.5' LT. B.L. SURVEY STA. 2+23 57TH PLACE
EL. 41.59

* CUT ON CONC. CURB 42.41 RT. & STA.
219+32.29 KENILWORTH AVENUE
EL. 49.87

W.S.S.C. B.M. - BOLT & WASHER IN PEPCO POLE
855474 68' LT. & STA. 66+65
EL. 36.89

W.S.S.C. B.M. - BOLT & WASHER IN PEPCO POLE
855474 68' LT. & STA. 69+58
EL. 45.69

□ CUT ON S.E. CORNER OF BOTTOM CONC. STEP
TO DWLG. #5702 82' LT. & STA. 78+65
EL. 51.53

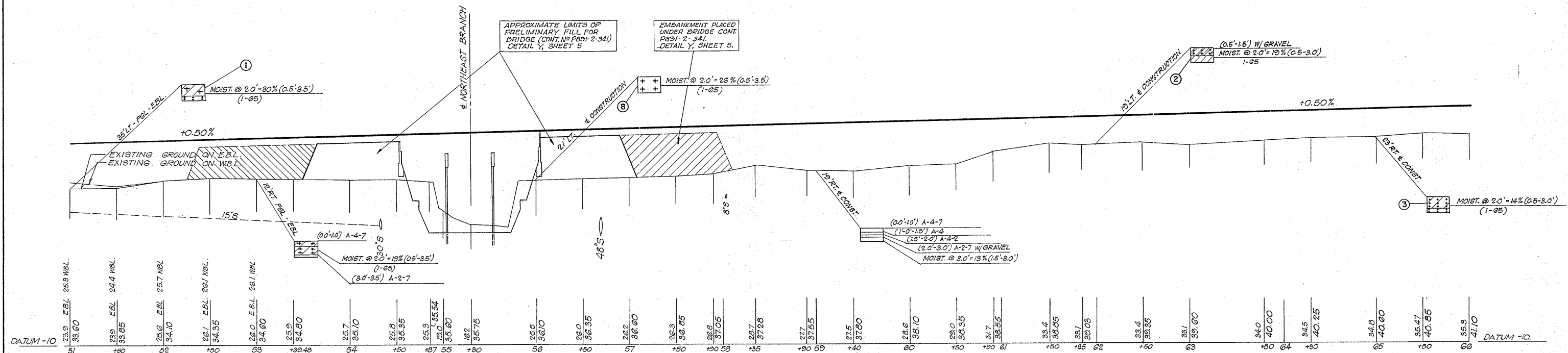
W.S.S.C. B.M. - BOLT & WASHER IN PEPCO POLE
84200 77' LT. & STA. 76+82
EL. 52.02

SPIKE IN 12" MAPLE 97' LT. & STA. 81+00
EL. 77.38

GREENHORNE & O'MARA
CONSULTING ENGINEERS
RIVERDALE, MARYLAND

REVISIONS
2/11/67
As Built 2-23-71

STATE OF MARYLAND
STATE ROADS COMMISSION
BUREAU OF DESIGN
EAST WEST HIGHWAY EXTENSION (MD. RTE. 410) US. RTE. 1 TO RIVERDALE ROAD.
CONT. NO. P-891-3-341 F. A. P. NO. SHEET NO. 10 OF 41
PREL. TRAC. BY FINAL TRAC. BY

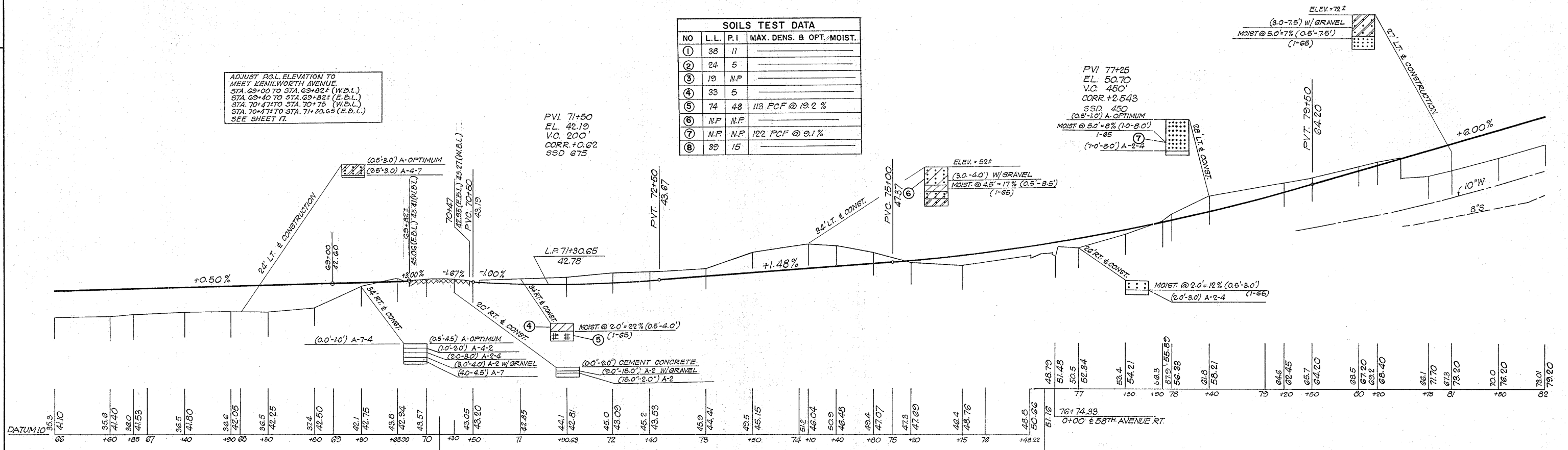


SOILS TEST DATA				
NO	L.L.	P.I.	MAX. DENS.	8 OPT. MOIST.
1	38	11		
2	24	5		
3	19	N.P.		
4	33	5		
5	74	48	113 PCF @ 19.2 %	
6	N.P.	N.P.		
7	N.P.	N.P.	122 PCF @ 31.1 %	
8	39	15		

ADJUST P.G.L. ELEVATION TO MEET KENILWORTH AVENUE.
STA. 69+00 TO STA. 69+82.5 (W.D.L.)
STA. 69+40 TO STA. 69+82.5 (E.D.L.)
STA. 70+41 TO STA. 70+75 (W.D.L.)
STA. 70+41 TO STA. 71+30.65 (E.D.L.)
SEE SHEET 17.

PVI. 71+50
EL. 42.19
V.C. 200'
CORR. +0.62
SSD 675

PVI 77+25
EL. 50.70
V.C. 450'
CORR. +2.543
SSD 450
(0.8'-1.0') A-OPTIMUM
MOIST. @ 5.0'-8% (1.0'-3.0')
1-65
(7'-8.0') A-2-4



SCALE { PLAN: 1 IN. = 50 FT.
PROFILE: HOR. 1 IN. = 50 FT.; VERT. 1 IN. = 10 FT.

GREENHORNE & O'MARA CONSULTING ENGINEERS RIVERDALE, MARYLAND	REVISIONS	STATE OF MARYLAND STATE ROADS COMMISSION	
		BUREAU OF DESIGN	
		EAST WEST HIGHWAY EXTENSION (MD. RTE. 410) US. RTE. 1 TO RIVERDALE ROAD	
		CONT. NO. P 891-3-341 F. A. P. NO. SHEET NO. 11 OF 41	

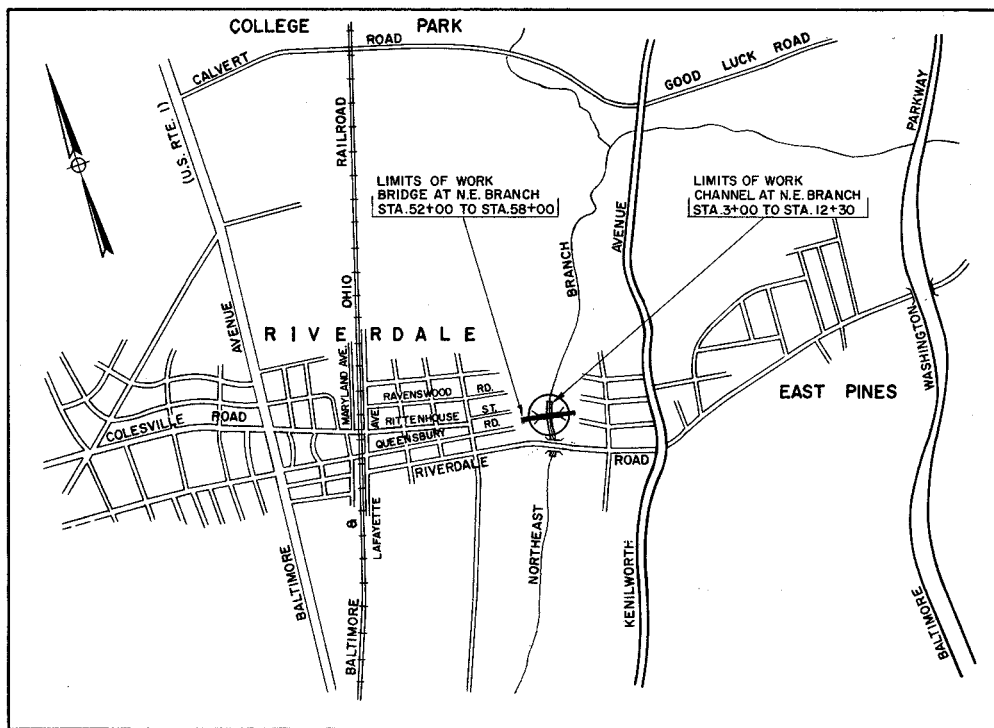
INDEX OF SHEETS

1. TITLE SHEET
2. PLAN & ELEVATION
3. NORTHEAST BRANCH CHANNEL
4. CHANNEL DETAILS
5. WEST ABUTMENT
6. EAST ABUTMENT
7. PIER NO. 1 & 2
8. FRAMING PLAN
9. JOINT DETAILS
10. MISCELLANEOUS DETAILS
11. FINISHED GRADE ELEVATIONS & BORINGS

STATE OF MARYLAND
STATE ROADS COMMISSION
PLANS OF BRIDGE(S) ON PROPOSED
STATE HIGHWAY

FEDERAL AID PROJECT NO.
MD. S.R.C. CONTRACT NO. P-891-2-341

EAST WEST HIGHWAY EXTENSION
BRIDGE OVER NORTHEAST BRANCH



LOCATION PLAN
SCALE: 1" = 0.25 MILES

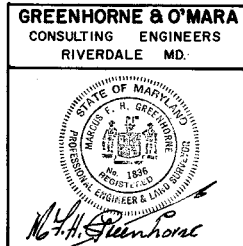
CONVENTIONAL SIGNS

STATE AND NATIONAL LINE	=====	CULVERTS	=====
COUNTY LINE	-----	RETAINING WALL	=====
CITY OR VILLAGE	-----	DROP INLET	=====
GUARD RAIL	=====	TROLLEY POLE	=====
FENCE LINE	=====	POWER POLE	=====
UNFENCED PROPERTY	-----	TELEPHONE OR TELEGRAPH POLE	=====
RIGHT OF WAY LINE	=====	MARSH	=====
TRAVELED WAY	=====	HEDGE	=====
RAILROADS	=====	GROUND ELEVATION	DATUM LINE 173.6
BASE OR SURVEY LINE	=====	GRADE ELEVATION	DATUM LINE 170.2

FOR DETAILS OF CULVERTS, ETC. SEE STANDARD SHEET.
STATE SPECIFICATIONS AND STANDARD PLANS ON FILE IN BUREAU OF PUBLIC ROADS.

DESIGN TRAFFIC DATA

	1964	1985 (EST.)
A.D.T.	12,250	29,470
D.H.V.	8%	8%
DIRECTIONAL DISTRIBUTION	63%	63%
PERCENT TRUCKS--A.D.T.	5	5
PERCENT TRUCKS--D.H.V.	3	3
DESIGN SPEED	40 M.P.H.	40 M.P.H.



DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DISTRICT ENGINEER DATE

REVIEWED AND APPROVAL RECOMMENDED

CHIEF, BUREAU OF BRIDGES

APPROVAL RECOMMENDED

ASSISTANT, CHIEF ENGINEER--DESIGN

APPROVED

CHIEF ENGINEER, STATE ROADS COMMISSION



SOILS TEST DATA			
NO	L.L.	P.I.	MAX. DEN. & OPT. MOIST.
1	N.P.	N.P.	
2	23	N.P.	
3	17	N.P.	
4	N.P.	N.P.	
5	35	11	
6	31	7	
7	29	7	

NOTE:
BORINGS ARE REFERENCED TO
ELEVATIONS ARE REFERENCED TO
TOP OF LEFT OR RIGHT BANK.

NORTHEAST BRANCH CHANNEL
TYPICAL SECTIONS A & B SHEET 4.

CURVE DATA
PROFILE GRADE LINE E.B.L.
Δ = 6°21'30"
Dc = 1°30'00"
R = 389.72
T = 212.16
L = 423.89
SE = 0.020

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.		3	11

EARTHWORK SUMMARY

CLASS 1 EXCAVATION	0
Cut Plus Topsoil Removed in Fill	1,230 Cu.Yd.
TOTAL CLASS 1 EXCAV.	1,230 Cu.Yd.
CLASS 2, 3, & 5 EXCAVATION	1,182 Cu.Yd.
Class 2, Exc. (Ditches)	57
Class 3, Exc.	15,267
Class 5, Exc.	330
Minus Channel Backfill	16,116 Cu.Yd.
TOTAL	3,058 Cu.Yd.
Waste (Approximate)	3,058
TOTAL EXC. AVAILABLE FOR EMBANKMENT	3,058 Cu.Yd.
EMBANKMENT REQUIRED	8,700 Cu.Yd.
Preliminary Embankment	1,330
Defill For Topsoil in Fill	9,330 Cu.Yd.
Embankment Required	3,330
Borrow Required	1,986
TOTAL BORROW	11,916 Cu.Yd.

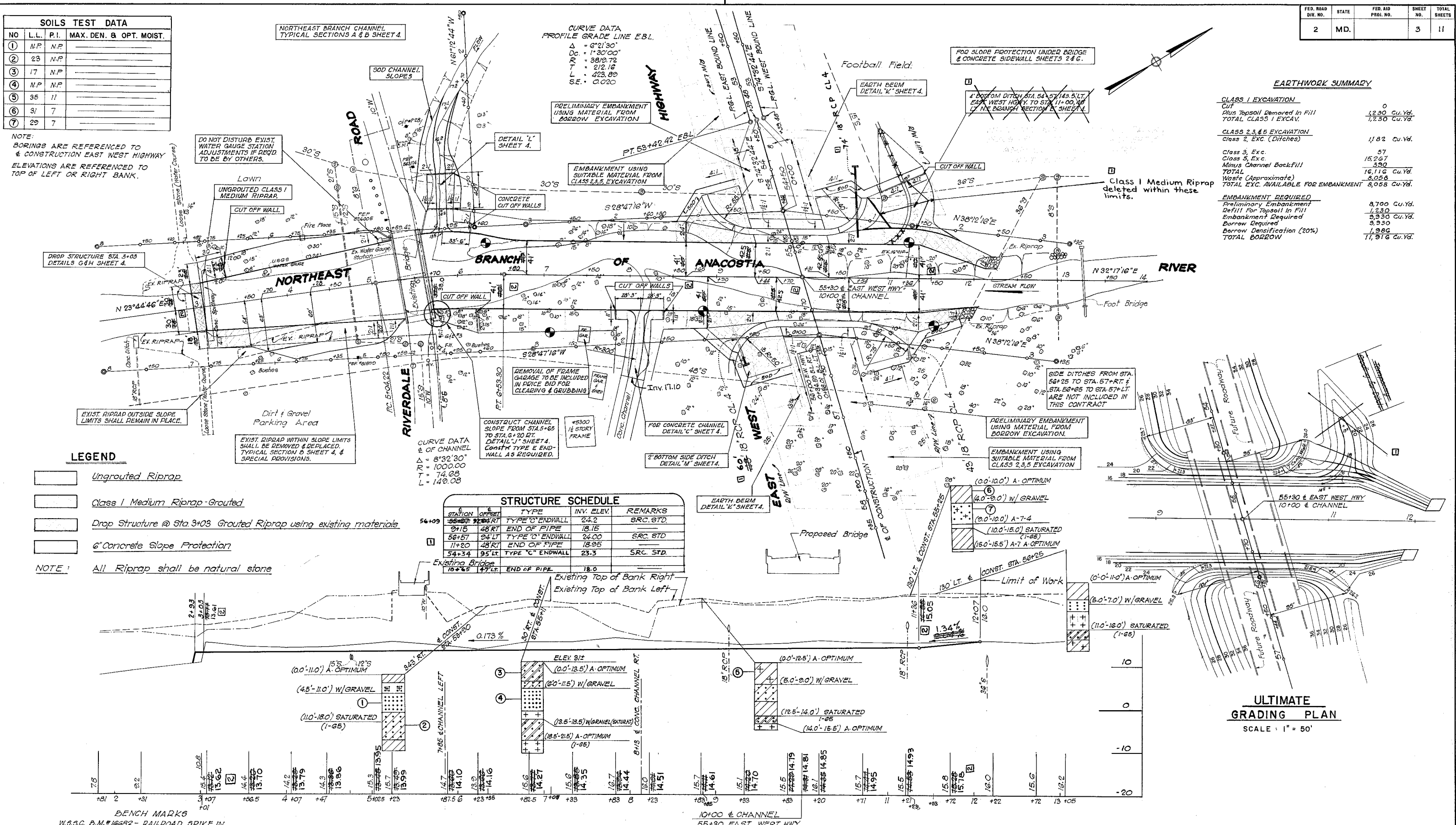
LEGEND

- UngROUTed Riprap
- Class I Medium Riprap-Grouted
- Drop Structure @ Sta. 3+03 Grouted Riprap using existing materials
- 6" Concrete Slope Protection

NOTE: All Riprap shall be natural stone

STRUCTURE SCHEDULE				
STATION	TYPE	INVT. ELEV.	REMARKS	
54+09	TYPE "C" ENDWALL	24.2	SRC. STD.	
54+16	END OF PIPE	18.15		
56+57	TYPE "C" ENDWALL	24.00	SRC. STD.	
11+20	END OF PIPE	18.95		
54+34	TYPE "C" ENDWALL	23.3	SRC. STD.	
16+45	END OF PIPE	18.0		

ULTIMATE GRADING PLAN SCALE: 1" = 50'

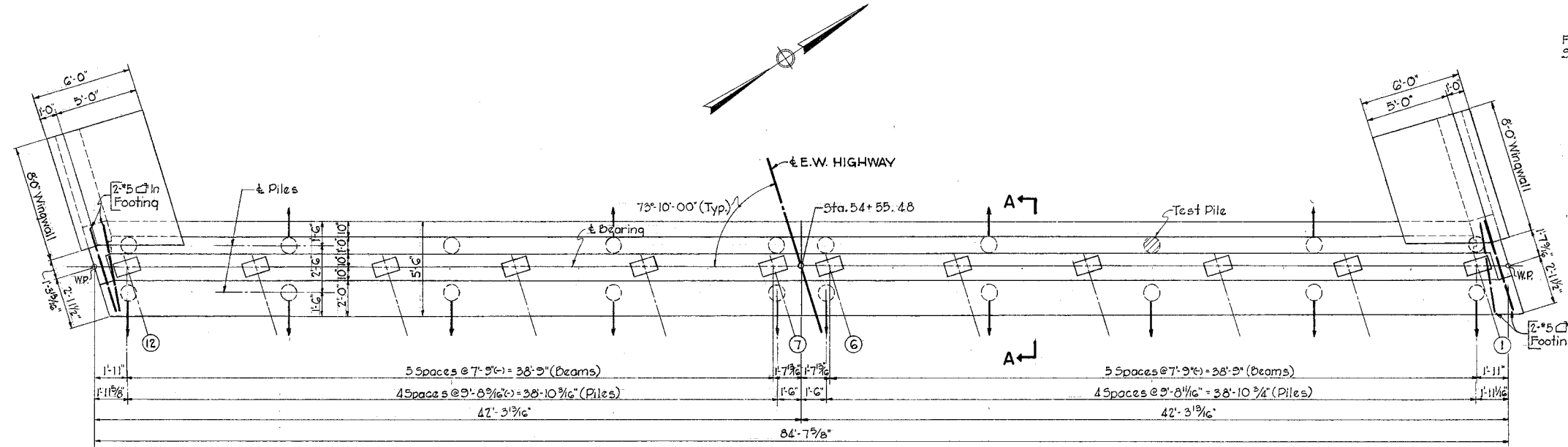


BENCH MARKS
W.S.C. B.M. #16682 - RAILROAD SPIKE IN
PEPCO POLE 0.25/130 10' LT. STREAM SPUR
3+01 (SPUR LT. 54+150 = 0+00)
E.L. 28.64

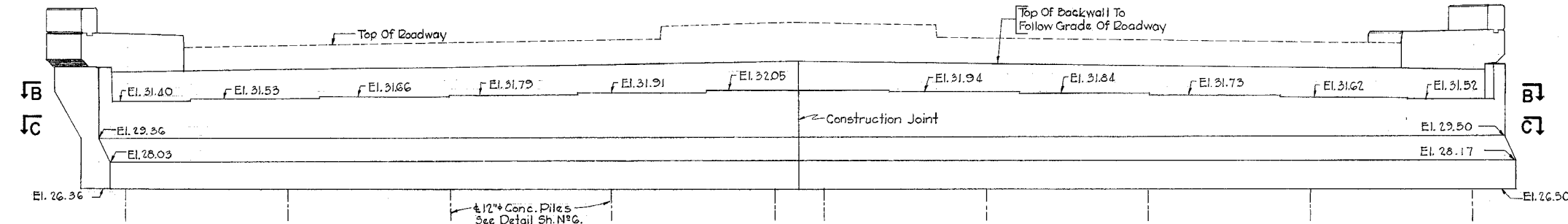
W.S.C. B.M. BOLT & WASHER IN PEPCO POLE
83938 19' LT. STA. 0+73 54TH AVE. LT.
E.L. 33.55

SCALE PLAN: 1 IN. = 50 FT.
PROFILE: HOR. 1 IN. = 50 FT.; VERT. 1 IN. = 10 FT.

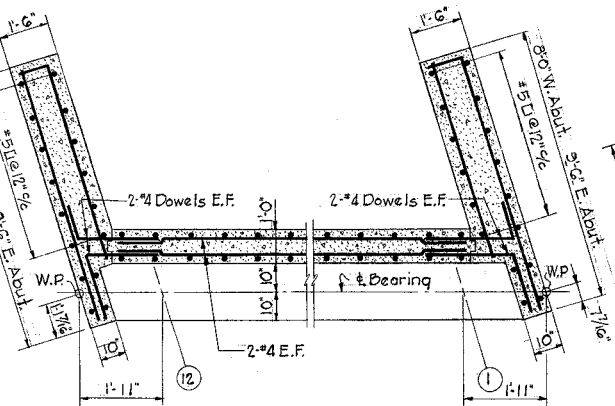
GREENHORNE & O'MARA CONSULTING ENGINEERS RIVERDALE, MARYLAND	REVISIONS		STATE OF MARYLAND STATE ROADS COMMISSION BUREAU OF DESIGN EAST WEST HIGHWAY EXTENSION - BRIDGE OVER NORTHEAST BRANCH CONT. NO. P 891-2-341 F. A. P. NO. SHEET NO. 3 OF 11 PREL. TRAC. BY EPD FINAL TRAC. BY
	1	4" Bottom Ditch and a portion of riprap at N.W. corner of bridge deleted. 18" RCP added.	
	2	Revised channel invert 0.5 ft. to clear 8' existing 2'-23'-6"	
	3		



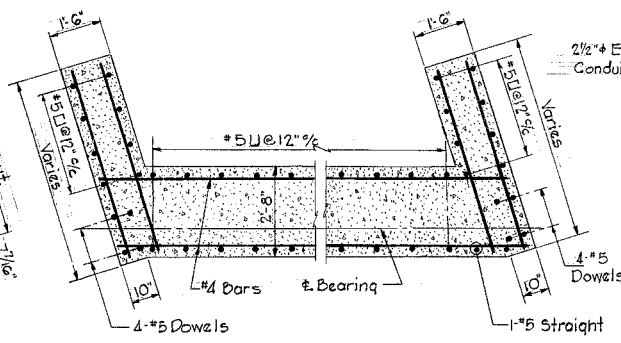
PLAN
Scale: 1/8" = 1'-0"



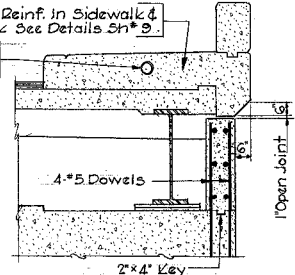
ELEVATION
Scale: 1/4" = 1'-0"



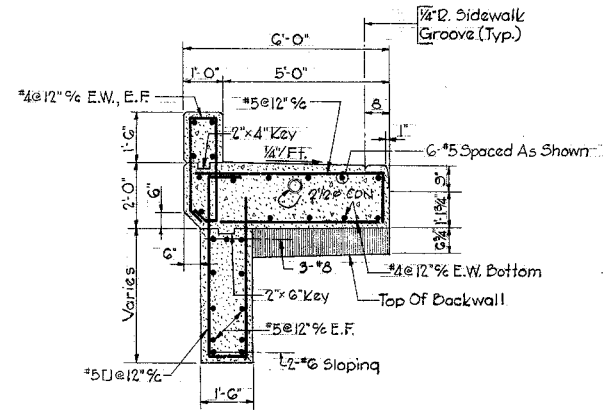
SECTION B-B
Scale: 3/8" = 1'-0"



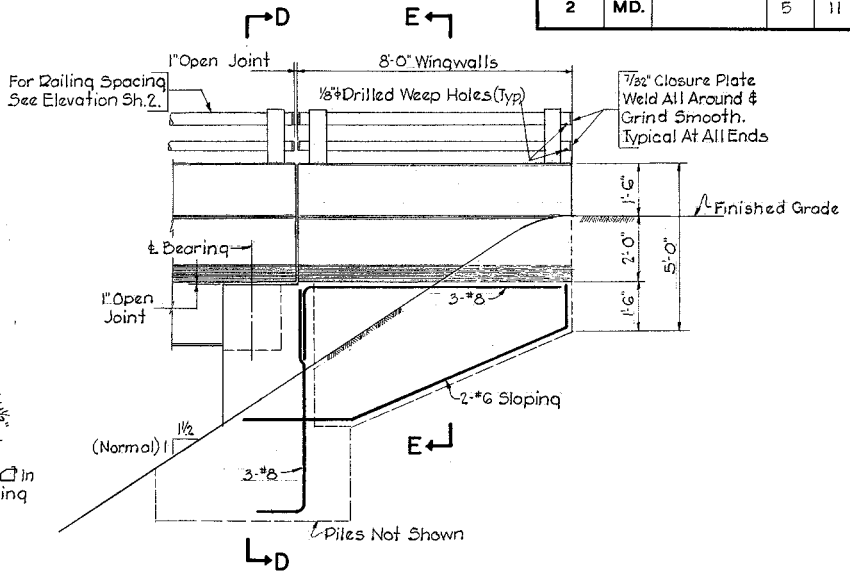
SECTION C-C
Scale: 3/8" = 1'-0"



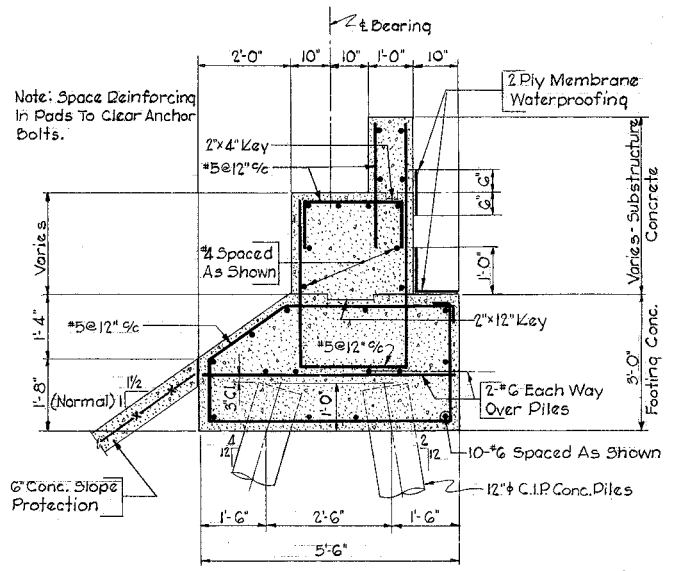
SECTION D-D
Scale: 3/8" = 1'-0"



SECTION E-E
Scale: 3/8" = 1'-0"

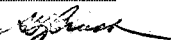


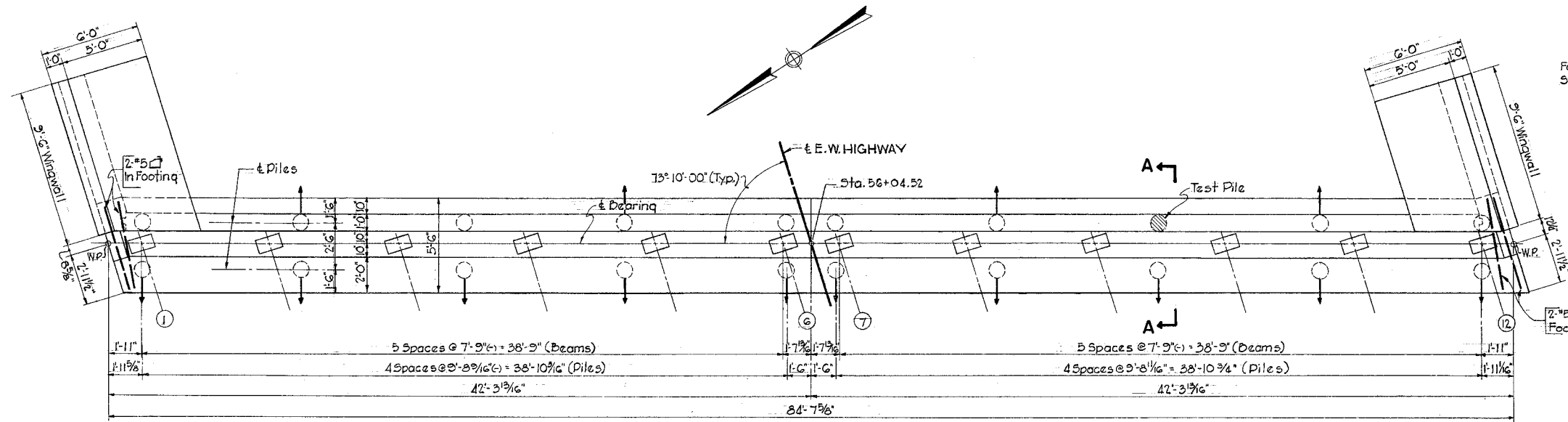
ELEVATION N.W. WINGWALL
S.W. WINGWALL SIMILAR
Scale: 3/8" = 1'-0"



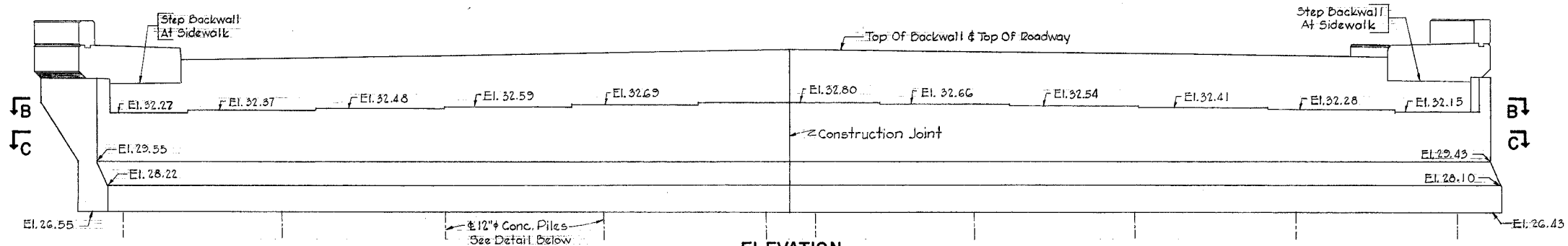
SECTION A-A
Scale: 1/2" = 1'-0"

Note: For Preliminary Embankment Detail See Sheet No. 11.

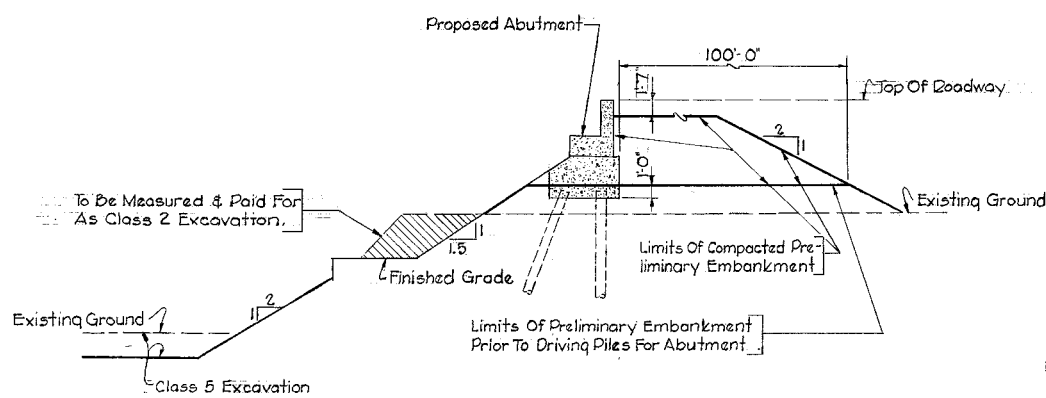
REVISIONS		STATE OF MARYLAND STATE ROADS COMMISSION BALTIMORE, MD. EAST WEST HIGHWAY EXTENSION BRIDGE OVER NORTHEAST BRANCH WEST ABUTMENT		
		SCALE As Shown	DATE	CONTRACT P89-2-341
		MADE BY <u>J.M.D.</u>		
		TRACED BY <u>J.M.D.</u>		
		CHECKED BY <u>J.A.M.</u>		
		APPROVED <u></u>		
		<u>11/3/65</u> CHIEF, BUREAU OF BRIDGES		
		SHEET NO. 5 OF 11		
File No. <u>3</u> Pocket No. <u>16</u> Folder No. <u>20</u>		INDEXED		



PLAN
Scale: 1/4" = 1'-0"

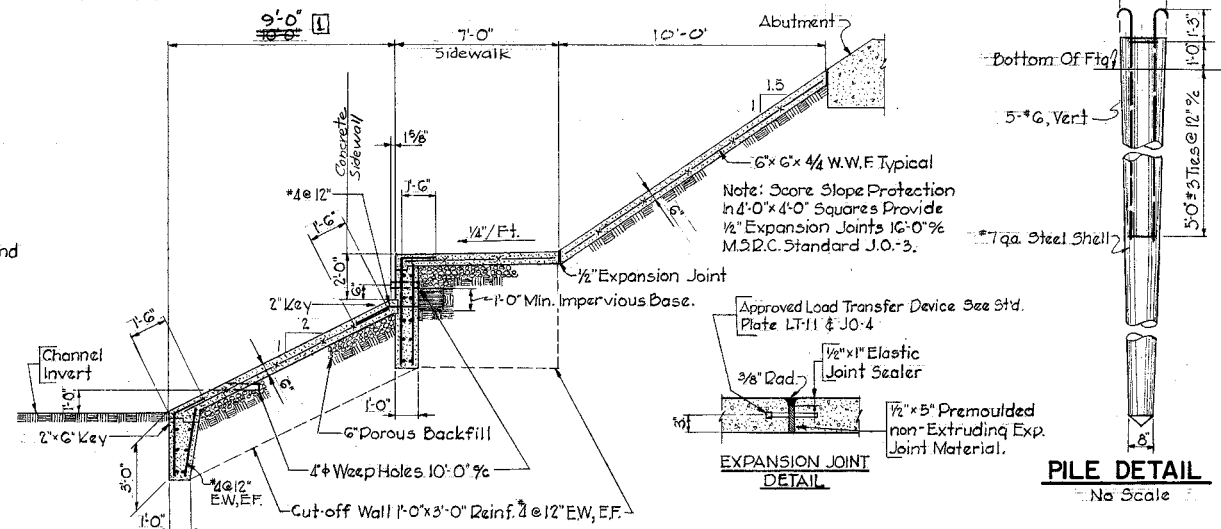


ELEVATION
Scale: 1/4" = 1'-0"

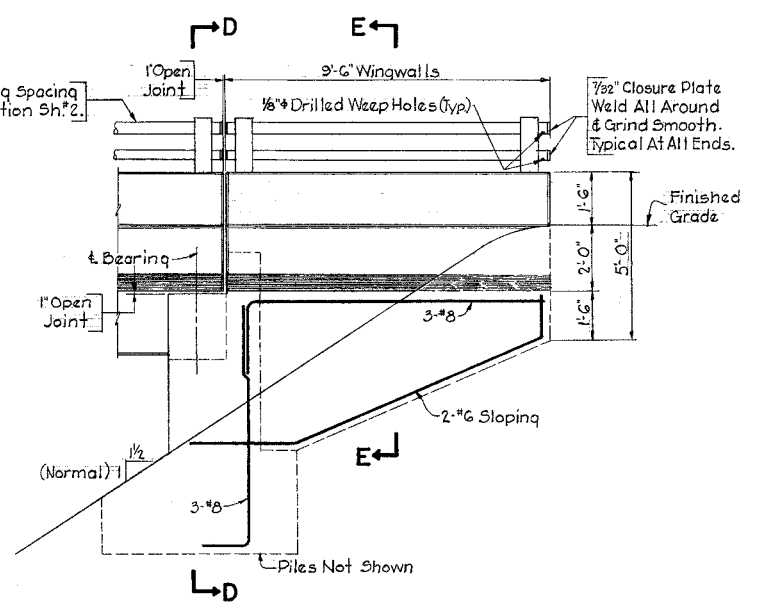


Note: For Preliminary Embankment Detail West Abut. See Sheet N#11.

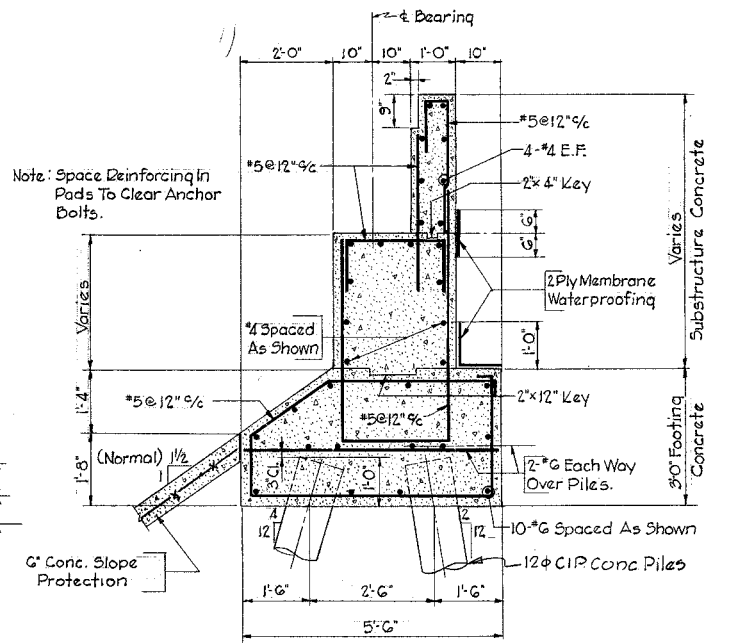
PRELIMINARY EMBANKMENT DETAIL
Scale: 1/8" = 1'-0"



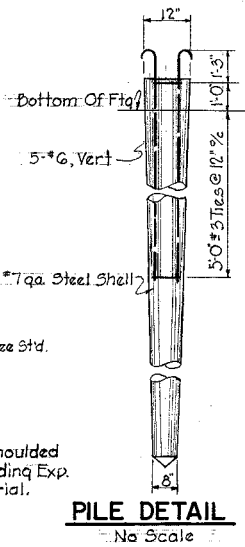
SLOPE PROTECTION DETAIL
Scale: 1/4" = 1'-0"



ELEVATION S.E. WINGWALL
N.E. WINGWALL SIMILAR
Scale: 3/8" = 1'-0"



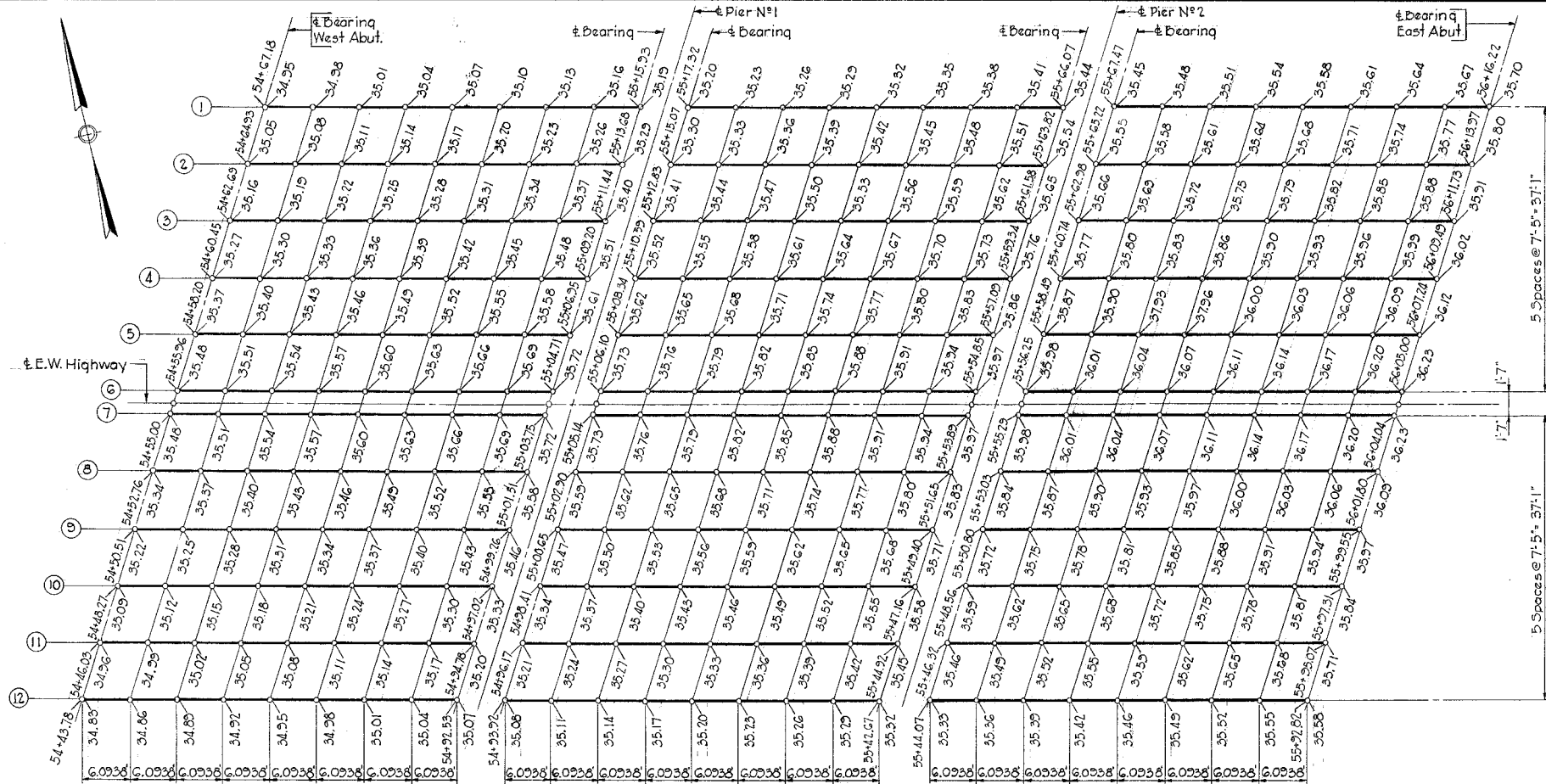
SECTION A-A
Scale: 1/2" = 1'-0"



PILE DETAIL
No Scale

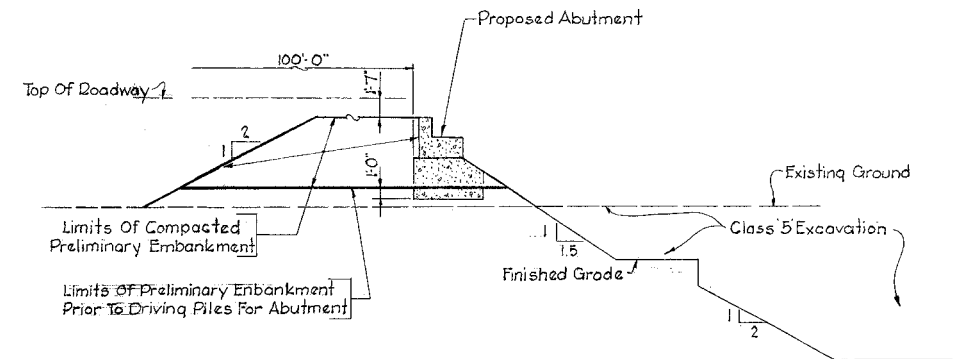
GREENHORNE & O'MARA
CONSULTING ENGINEERS
RIVERDALE, MARYLAND

REVISIONS 1. Raised Channel Invert 0.5 ft to clear 8" gas line. 2-23-66 T.F.S.	STATE OF MARYLAND STATE ROADS COMMISSION BALTIMORE, MD. EAST WEST HIGHWAY EXTENSION BRIDGE OVER NORTHEAST BRANCH EAST ABUTMENT		
	SCALE As Shown	DATE	CONTRACT P891-2-341
	MADE BY J.M.D.		
	TRACED BY J.M.D.		
	CHECKED BY J.A.M.		
	APPROVED		
	11/3/65	CHIEF, BUREAU OF BRIDGES	
	File No. 3	Pocket No. 12	Folder No. 20
	BRIDGE No. 16188	Survey Book No.	INDEXED



Note: Elevations Shown Are Finished Grade Elevations Given Along & Beam.

PLAN



PRELIMINARY EMBANKMENT DETAIL WEST ABUTMENT

Scale: 1/8" = 1'-0"

Topsoil	El. 26.0
4	A-4-2 Brown Silty Sand & Gravel
12	A-2 Grey Sand & Gravel
11	A-2-4 Grey Silty Sand
19	
21	A-7-2 Brown Sandy Clay
23	
26	
25	A-4-2 Vari. Color Sandy Silt
24	A-4-2 Grey Sandy Silt (Small Layers Of Sandstone)
23	A-4 Grey Silt

BORING NO.-1

Topsoil	El. 26.5
14	A-4-7 Brown Clayey Silt
13	A-4-2 Grey Sandy Silt & Gravel
34	A-2 Brown Sand & Gravel
30	A-2-4 Grey Silty Sand
22	A-7-1 Vari. Color Silty Clay
14	A-4-2 Vari. Color Sandy Silt
18	
31	A-2 Grey Silt (Small Intermittent Layers Of Clay)
27	A-7-2 Brown Sandy Clay
41	

BORING NO.-2

Topsoil	El. 24.7
21	A-4-2 Brown Silty Sand & Gravel
16	
18	A-4-2 Brown & Grey Sandy Silt
61	
84	A-2 Grey Sand
89	
Blows Per Ft. On Sample	
Description Of Material	
Blows On Casing	

BORING NO.-3

Topsoil	El. 25.7
10	A-4-7 Brown Clayey Silt
29	A-4-2 Grey Sandy Silt & Gravel
14	A-2 Brown Sand & Gravel
29	A-4-2 Brown Sandy Silt
85	A-2 Grey Sand
37	A-4-2 Grey Sandy Silt (Intermittent Layers Of Sand)
64	A-2 Grey Sand

BORING NO.-4

LEGEND

Distance Hammer Drop: 30 in.
Drive Hammer: 300 lbs.
Spoon Hammer: 140 lbs.
Casing Size: 2 1/2 in.
Spoon Size: 2 in.
W.L.: Ground Water
Classification: Visual

REVISIONS	STATE OF MARYLAND STATE ROADS COMMISSION BALTIMORE, MD. EAST WEST HIGHWAY EXTENSION BRIDGE OVER NORTHEAST BRANCH FINISHED GRADE ELEVATIONS & BORINGS
SCALE 1" = 10'-0"	DATE
MADE BY J.M.D.	CONTRACT P-891-2-34
TRACED BY J.M.D.	
CHECKED BY R.C.S.	
APPROVED	
11/3/65	CHIEF, BUREAU OF BRIDGES
10108	SHEET NO. 11 OF 11

GREENHORNE & O'MARA
CONSULTING ENGINEERS
RIVERDALE, MARYLAND

Survey Book No.

File No. 3 Pocket No. Folder No. 20

INDEXED



Appendix E

Soil and Rock Classification System

SUMMARY OF BURMISTER SOIL CLASSIFICATION SYSTEM

Granular Soils

Principal Component:		GRAVEL, SAND, SILT		50% or more	
Other Components:		Gravel, Sand, Silt (+) nearer upper limit (-) nearer lower limit (no sign) middle of range	and some little trace	35-50% 20-35% 10-20% 1-10%	

Particle Size Definitions				Density/Compactness	
Soil	Fraction	Sieve Number and Size		Description	SPT N-Value
Gravel	coarse	3 to 1 in	(76 mm to 25 mm)	Very loose	0-5
	medium	1 in to 3/8 in	(25 mm to 9.5 mm)	Loose	5-10
	fine	3/8 in to No. 10	(9.5 mm to 2.0 mm)	Medium Dense	10-30
Sand	coarse	No. 10 to No. 30	(2.0 mm to 0.6 mm)	Dense	30-50
	medium	No. 30 to No. 60	(0.6 mm to 0.25 mm)	Very Dense	>50
	fine	No. 60 to No. 200	(0.25 mm to 0.075 mm)		
Silt		<No. 200	(<0.075 mm)		

Gradation of Components	
c-f/cmf	>10% all fractions
c-m/m-f/c/m/f	<10% unnamed fraction

Clay Soils And Organic Soils

Overall Plasticity	Plasticity Index	Thread Diameter	Written As	Notes:
Slight PI	1-5	1/4" (6 mm)	Clayey SILT	1. Thread diameter indicates the size of thread attained at the ball moisture. 2. Ball moisture - Well worked ball, 1-1/2 in (40 mm) diameter which will exhibit a flat surface 3/4 to 1 (18 to 25 mm) in diameter when dropped 2 feet (0.6 m) at the proper moisture content.
Low PI	5-10	1/8" (3 mm)	SILT & CLAY	
Medium PI	10-20	1/16" (1.5 mm)	CLAY & SILT	
High PI	20-40	1/32" (0.75 mm)	Silty CLAY	
Very High PI	40 or more	1/64" (0.4 mm)	CLAY	

Consistency	SPT N-value	Unconfined Strength		Characteristics
		tsf	(KPa)	
Very Soft	<2	<0.25	(<25)	Extrudes between fingers when squeezed.
Soft	2-4	0.25-0.50	(25-50)	Can be pinched in two between thumb and forefinger.
Medium Stiff	4-8	0.50-1.0	(50-100)	Can be imprinted easily with fingers.
Stiff	8-15	1.0-2.0	(100-200)	Remolded by light finger pressure.
Very Stiff	15-30	2.0-4.0	(200-400)	Can be imprinted with considerable finger pressure, or indented with thumb nail.
Hard	>30	>4.0	(>400)	Can barely be imprinted by finger pressure, or indented by thumb nail.
				Cannot be imprinted by fingers, or difficult to indent by thumb nail.

EXAMPLES:	Full	-	brown, coarse+ medium to fine SAND, some medium to fine Gravel, trace+ Silt, very dense	
	Abbreviated	-	br c+mf SAND, s. mf Gravel, t+ Silt, v. dense	
	Full	-	gray, CLAY & SILT, little+ coarse - medium to fine+ Sand, Medium Plasticity, stiff, moist	
	Abbreviated	-	gray CLAY & SILT, l + c-mf+S, M.PI, stiff, moist	

SUMMARY OF UNIFIED SOIL CLASSIFICATION SYSTEM

Field Identification Procedures (Excluding particles larger than 75 µm and basing fractions on estimated weights)	Group Symbols	Typical Names	Information Required for Describing Soils	Use grain size curve in identifying the fractions as given under field identification	Laboratory Classification Criteria	Plasticity chart for laboratory classification of fine grained soils
Coarse-grained soils More than half of material is larger than 75 µm sieve size	Gravels More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity; surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses	Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 µm sieve size) coarse-grained soils are classified as follows: GW, GP, SW, SP GM, GC, SM, SC Borderline cases requiring use of dual symbols	$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ Between 1 and 3	
		Poorly graded gravels, gravel-sand mixtures, little or no fines			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Silty gravels, poorly graded gravel-sand-silt mixtures			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Clayey gravels, poorly graded gravel-sand-clay mixtures	For undisturbed soils add information on stratification, degree of compaction, cementation, moisture conditions and drainage characteristics Example: Silty sand, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM)		Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Well graded sands, gravelly sands, little or no fines			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
Fine-grained soils More than half of material is smaller than 75 µm sieve size	Sands and clays greater than 50 µm sieve size	Clean sands (little or no fines)			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Sands with fines (appreciable amount of fines)			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Plastic fines (for identification procedures, see CL below)			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Wide range in grain sizes and substantial amounts of all intermediate particle sizes			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	
		Poorly graded sands, gravelly sands, little or no fines			Not meeting all gradation requirements for GP Aterberg limits below "A" line, or PI less than 4 Aterberg limits above "A" line, with PI greater than 7	

For example GW-CC, well graded gravel-sand mixture with clay binder.

combinations of group symbols. The

Characteristics of two groups are designated by α and β

From Wagner, 1957.
A *Boundary classification*. Soils possessing chara-

Boundary classifications. Soils possessing characteristics of two or more of the boundary classifications are designated by the boundary classification number followed by the letter "B".

Boundary classification
b All sieve sizes on the

Summary of Terms for Describing Rock Core (Sheet 1 of 2)

QUICK REFERENCE ROCK LOGGING GUIDE FOR FIELD USE

GRAIN SIZE

TERM	GRAIN SIZE
Fine-grained	Not visible to barely visible with naked eye
Medium-grained	Barely to easily visible with naked eye; up to 1/8" (3 mm)
Coarse-grained	> 1/8" (3 mm)

CONTINUITY

TERM	LENGTH OF DRILL CORE STEM PIECES
Sound	>8" (200 mm)
Slightly Fractured	4"-8" (100-200 mm)
Moderately Fractured	1"-4" (25-100 mm)
Extremely Fractured	<1" (25 mm)

DISCONTINUITY DESCRIPTION

FRACTURE SPACING (JOINTS, FAULTS, OTHER FRACTURES)			BEDDING SPACING (MAY INCLUDE FOLIATION OR BANDING)		
DESCRIPTION	SPACING		DESCRIPTION	SPACING	
Extremely close	< 3/4 in	(<19 mm)	Laminated	< 1/2 in	(12 mm)
Very close	3/4 in - 2-1/2 in	(19 - 60 mm)	Very thin	1/2 in - 2 in	(12 - 50 mm)
Close	2-1/2 in - 8 in	(60 - 200 mm)	Thin	2 in - 1 ft	(50 - 300 mm)
Moderate	8 in - 2 ft	(200 - 600 mm)	Medium	1 ft - 3 ft	(300 - 900 mm)
Wide	2 ft - 6 ft	(600 mm - 2.0 m)	Thick	3 ft - 10 ft	(900 mm - 3 m)
Very wide	6 ft - 20 ft	(2.0 - 6 m)	Massive	> 10 ft	(3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) Record orientation (angle) on log. For example, a horizontal bedding plane would have a 0 degree angle.

WEATHERING

TERM	DESCRIPTION	Grade
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces	I
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.	II
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.	III
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.	IV
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.	V
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported	VI

The terms and description below help to define some of the descriptions used in the above table.

Fresh	No visible sign of weathering of the rock material.
Discolored	The color of the original fresh rock material is changed. The degree of change from the original color should be indicated. If the color change is confined to particular mineral constituents, this should be mentioned
Decomposed	The rock is weathered to the condition of a soil in which the original material fabric is still intact, but some or all of the mineral grains are decomposed.
Disintegrated	The rock is weathered to the condition of a soil in which the original fabric is still intact. The rock is friable, but the mineral grains are not decomposed.

Summary of Terms for Describing Rock Core (page 2 of 2)

STRENGTH OR HARDNESS

GRADE	DESCRIPTION	FIELD IDENTIFICATION	UNIAXIAL COMPRESSIVE STRENGTH, PSI (MPa)
R0	Extremely weak	Indented by thumbnail	40-150 (0.3-1)
R1	Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
R2	Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4000 (5-30)
R3	Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4000-7000 (30-50)
R4	Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7000-15,000 (50-100)
R5	Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
R6	Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)
Assess the strength of any filling materials along discontinuity surfaces in accordance with the following descriptions and grades.			
GRADE	DESCRIPTION	FIELD IDENTIFICATION	UNIAXIAL COMPRESSIVE STRENGTH, KSF (KPa)
S1	Very soft clay	Easily penetrated several inches (cm) by fist	0.5 (25)
S2	Soft clay	Easily penetrated several inches (cm) by thumb	0.5-1.0 (25-50)
S3	Firm clay	Can be penetrated several inches (cm) by thumb with moderate effort	1.0-2.0 (50-100)
S4	Stiff clay	Readily indented by thumb but penetrated only with great effort	2.0-5.0 (100-250)
S5	Very stiff clay	Readily indented by thumbnail	5.0-10.0 (250-500)
S6	Hard clay	Indented with difficulty by thumbnail	>10.0 (>500)
<ul style="list-style-type: none"> Grades S1 to S6 apply to cohesive soils for example clays, silty clays, and combinations of silts and clays with sand, generally slow draining. If non-cohesive fillings are identified, qualitatively identify, e.g., fine sand. Discontinuity wall strength will generally be characterized by grades R0-R6 (rock) while S1-S6 (clay) will generally apply to filled discontinuities. 			

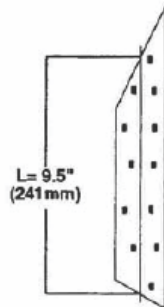
JOINT ROUGHNESS (J_r) NUMBER

	J _r
ROCK WALL CONTACT ALONG DISCONTINUITY SURFACE	
A. Discontinuous joints	4
B. Rough or irregular, undulating	3
C. Smooth, undulating	2
D. Slickensided, undulating	1.5
E. Rough or irregular, planar	1.5
F. Smooth, planar	1.0
G. Slickensided, planar	0.5
NO ROCK WALL CONTACT ALONG DISCONTINUITY SURFACE	
H. Zone containing clay minerals thick enough to prevent rock wall contact	1.0 (nominal)
I. Sandy, gravelly, or crushed zone thick enough to prevent rock wall contact	1.0 (nominal)

JOINT ALTERNATION (J_a) NUMBER

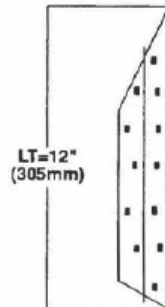
	J _a
ROCK WALL CONTACT, OR COATING <1/8 IN. (3 MM) THICK	
A. Tightly healed, hard, non-softening, impermeable filling, i.e., quartz or epidote	0.75
B. Unaltered joint walls, surface staining only	1.0
C. Slightly altered joint walls. Non-softening mineral coatings, sandy particles, clay-free disintegrated rock etc.	2.0
D. Silty- or sandy-clay coatings, small clay-fraction (non-softening)	3.0
E. Softening or low friction clay mineral coatings, i.e., kaolinite, mica. Also chlorite, talc, gypsum, graphite, etc., and small quantities of swelling clays.	4.0
NO ROCK WALL CONTACT, CONTINUOUS COATINGS <1/4 IN (5 MM) THICK	
F. Sandy particles, clay-free disintegrated rock etc.	4.0
G. Strongly over-consolidation, softening, clay mineral fillings. (Continuous, <5 mm in thickness)	6.0
H. Medium or low over-consolidation, softening, clay mineral fillings. (Continuous, <5 mm in thickness)	8.0
J. Swelling clay fillings, i.e., montmorillonite (Continuous, <5 mm in thickness). Value of J _a depends on percent of swelling clay-size particles and access to water, etc.	8.0-12.0
NO ROCK WALL CONTACT, CONTINUOUS COATINGS >1/4 IN (5 MM) THICK	
K.,L.,M. Crushed rock and clay (see G., H., J., for description of clay condition)	6.0, 8.0 or 8.0-12.0
N. Zones or bands of silty- or sandy clay, small clay fraction (nonsoftening)	5.0
O.,P.,R. Thick continuous zones or bands of clay (see G., H., J. for description of clay condition)	10.0, 13.0 or 13.0-20.0

**Correct
Method**



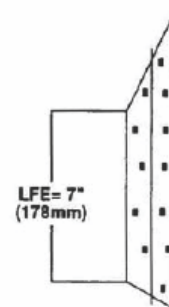
2"(51mm) Diam. Core

**Incorrect
Method**

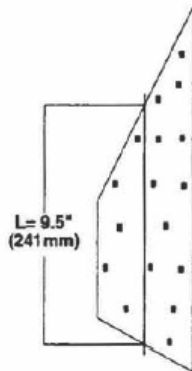


2"(51mm) Diam. Core

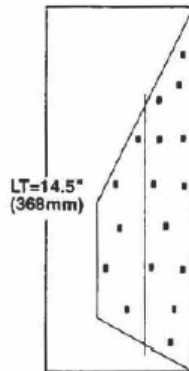
**Incorrect
Method**



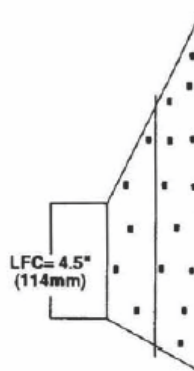
2"(51mm) Diam. Core



4"(102mm) Diam. Core



4"(102mm) Diam. Core



4"(102mm) Diam. Core

Centerline

A. Correct Method for Core
Length Measurement;
Length of Core
Independent on Core Diameter

Tip to Tip

B. Incorrect Method for Core
Length Measurement;
Length of Core
Dependent on Core Diameter

Fully Circular

C. Incorrect Method for Core
Length Measurement;
Length of Core
Dependent on Core Diameter

Length Measurement of Core for RQD Determination

GLOSSARY OF TERMS USED IN ROCK CORE BORING LOGS

Arenaceous: A sedimentary rock descriptive term that signifies the rock consists in part of sand-size particles.

Argillaceous: A sedimentary rock descriptive term that signifies the rock is comprised of a large percentage (but less than 50%) of clay.

Bedding: A surface, generally planar or nearly planar, that visibly separates each successive layer of stratified rock from the preceding or following layer.

Swirly bedding: Tightly curved, wavy pattern throughout texture of rock.

Color-banding: Shades of alternating color in very thin bands parallel to the bedding. Differing lithology or grain size in the various bands is possible.

Discontinuity: A collective term for most types of joints, bedding planes, schistosity planes, shear and fault zones.

Fault: A fracture or fracture zone along which there has been recognizable displacement.

Fissile: Exhibiting the property of easily splitting into very thin layers parallel to the bedding.

Friable: Easily crumbled, as would be the case with rock that is poorly cemented.

Grain size:

Fine-grained (rock): Grain size not visible to just barely visible with naked eye.

Medium-grained (rock): Grain size barely to easily visible with the naked eye; up to 1/8 in. (3 mm).

Coarse-grained (rock): Grain size 1/8 in. (3 mm) or greater.

Joints: A break of geological origin in the continuity of a rock mass along which there has been no visible displacement.

Horizontal: Natural breaks inclined to a horizontal plane from 0° to 5°.

Low angle: Natural breaks inclined to a horizontal plane from 5° to 35°.

Moderately dipping: Natural breaks inclined to a horizontal plane from 35° to 55°.

High angle: Natural breaks inclined to a horizontal plane from 55° to 85°.

Vertical: Natural breaks inclined to a horizontal plane from 85° to 90°.

Mottling: Irregular color patches of limited extent.

Oolitic: Composed of smooth, rounded granules.

Parting: Natural break in the rock caused by change in lithology or grain size, parallel to the bedding. Unlike joints, which can be limited in extent or trend by the thickness of the formation, partings are usually persistent in every direction parallel to the bedding. Often marked by a very thin bed or seam of soft rock or mineral. Stylolitic partings are rough, irregular, and faced with argillaceous materials (see Stylolite).

Pit: Cavity up to 1/4 in. (6mm) size.

Shear: A localized expression of strain resulting from stresses that cause or tend to cause slippage along a plane at the contact of two contiguous parts of a body.

Slickensides: Smooth, highly polished argillaceous facing on a shear. Trace slickensides are not highly polished, but marked by some sign of small movement, such as very small polished areas and/or parallel grooves and striations on a joint face.

Stylolite: A surface, usually in homogeneous carbonate rocks, marked by an irregular and interlocking penetration of the two sides; in cross section it resembles a suture; the seam is characterized by a concentration of clay, carbon, or iron oxides.

Surface Planarity:

Planar - A flat surface.

Stepped - A surface with asperities or steps. The height of the asperity should be estimated or measured.

Wavy - A moderate undulating surface; curved, smoothly uneven.

Surface Roughness:

Very Rough - Near vertical steps and ridges occur on the discontinuity surface.

Rough - Some ridges and side-angle steps are evident; asperities are clearly visible; and discontinuity surface feels very abrasive.

Slightly Rough - Asperities on the discontinuity surface are distinguishable and can be felt.

Smooth - Surface appears smooth and feels so to the touch.

Slickensided - Visual evidence of polishing exists.

Trace: Amount less than 10%; not common.

Vug: Cavity larger than a pit; from 1/4 (6 mm) to 2 in. (50 mm) in size.

ote:

Many of the terms above were defined in the following two references:

1. Bates, R.L. and Jackson, J.A., EDS., Glossary of Geology, American Geological Institute, Falls Church, Va, 1980.
2. I.S.R.M., Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses.



Appendix F

Chevy Chase Boring Logs



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Jones 1**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and
Jones Bridge Rd intersection**

COORD. N: **1,293,477.0** E: **484,844.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **258.9 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/16/07** TIME: **9:00 am**

FINISH DATE: **5/17/07** TIME: **10:30 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■ 1.375"	U □	P □	G □	C □	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		2"				3"	5/17/07	7:45 am	20.6	41.5	60.8
Length		24"				5"					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS											
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)												
							CORING																
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %												
5			S	1	█	0.0 - 2.0	2	5	7	7	12	0 - 258.07 S-1A (Top 10 inches): Damp, stiff, dark brown, Clayey SILT, trace Gravel, trace Sand (CL-ML) S-1B (Bottom 2 inches): Damp, medium dense, fine to medium SAND and Silt, trace mica (SM) Same as S-1B (SM) Same as S-1B; faint relict rock structure (SM) Same as S-1B (SM) Damp, medium dense, mottled brown and light brown, fine to medium SAND, some Silt, trace mica (SM) Same as S-6 (SM) Same as S-6 (SM)											
			S	2		2.0 - 4.0	8	14	16	18	12												
			S	3		4.0 - 6.0	7	10	10	10	14												
			S	4		6.0 - 8.0	7	9	9	11	10												
			S	5		8.0 - 10.0	5	8	14	17	18												
			10		S	6	█	13.5 - 15.0	8	14	20		16										
														15		S	7	█	18.5 - 20.0	6	6	8	14



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **Jones 1**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
30			S	9		28.5 - 30.0	5	7	10		18	Moist, medium dense, fine to medium SAND and Silt, trace mica (SM)	
													Water encountered during drilling at 31'
35			S	10		33.5 - 35.0	20	31	50/6"		16	Same as S-9, very dense (SM)	
40			S	11		38.5 - 39.3	40	50/4"			10	Moist, very dense, fine to medium SAND, some Silt, trace mica (SM)	
												41.5	Auger refusal and coring begun at 41.5'
												217.4	
45													
50													
55													



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

BORING NUMBER: **Jones 1**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and Jones Bridge Rd intersection**

COORD. N: **1,293,477.0** E: **484,844.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **258.9 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/16/07** TIME: **9:00 am**

FINISH DATE: **5/17/07** TIME: **10:30 am**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
5/17/07	7:45 am	20.6	41.5	60.8

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	1:07	R-1 41.5 - 45.0	12	29	0	Brown, fine SAND, some silt, trace mica. Recovery is mostly discontinuous rock fragments that are completely to highly weathered and extremely weak.	V/IV	R0				
	0:58											
	1:11											
50	0:18/6"	R-2 45.0 - 50.0	9	15	0	Grayish brown, fine SAND, some clayey silt, trace mica; very fine friable fissiles in pockets < 3/4" diameter. Recovery is mostly discontinuous rock fragments that are completely to highly weathered and extremely weak.	V/IV	R0				
	1:54											
	1:29											
55	0:42	R-3 50.0 - 55.0	13	22	0	Gray, medium grained SCHIST, extremely weak, highly weathered, extremely close fracture spacing. Recovery is mostly discontinuous rock fragments.	IV	R0				
	0:46											
	0:42											
60	2:09	R-4 55.0 - 60.0	40	67	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, extremely close to very close fracture spacing, laminated foliation at 60°; high angle healed fractures perpendicular to bedding at 59.3-59.8'	III	R1				
	1:39											
	n/r*											
65	1:30	R-5 60.0 - 65.0	31	52	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, very close fracture spacing, laminated foliation at 60°; medium to coarse grained garnet throughout; quartz vein 1/4" thick at 61.1' and 60°; brown sandy deposit < 1/16" in fracture at 60.2'; brown clayey silt and fine sand deposits < 1/16" in fractures at 60.85' and 61.4'; gray fine sand and fine fissiles in fracture at 62.3'	III	R2				
	2:00											
	1:52											
65	3:16**	R-5 60.0 - 65.0	31	52	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, very close fracture spacing, laminated foliation at 60°; medium to coarse grained garnet throughout; quartz vein 1/4" thick at 61.1' and 60°; brown sandy deposit < 1/16" in fracture at 60.2'; brown clayey silt and fine sand deposits < 1/16" in fractures at 60.85' and 61.4'; gray fine sand and fine fissiles in fracture at 62.3'	III	R2	60★	3	1.0	57.2
	6:50**								60★	1.5	1.0	57.5
	5:40**								60★	1.5	1.0	57.8
65	3:04	R-5 60.0 - 65.0	31	52	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, very close fracture spacing, laminated foliation at 60°; medium to coarse grained garnet throughout; quartz vein 1/4" thick at 61.1' and 60°; brown sandy deposit < 1/16" in fracture at 60.2'; brown clayey silt and fine sand deposits < 1/16" in fractures at 60.85' and 61.4'; gray fine sand and fine fissiles in fracture at 62.3'	III	R2	30	1.5	1.0	58
	3:10								30	3	1.0	58.2
	3:20**								60★	1.5	1.0	58.45
65	3:50**	R-5 60.0 - 65.0	31	52	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, very close fracture spacing, laminated foliation at 60°; medium to coarse grained garnet throughout; quartz vein 1/4" thick at 61.1' and 60°; brown sandy deposit < 1/16" in fracture at 60.2'; brown clayey silt and fine sand deposits < 1/16" in fractures at 60.85' and 61.4'; gray fine sand and fine fissiles in fracture at 62.3'	III	R2	10	1.5	1.0	59.3
	2:12								60★	1.5	1.0	59.6
	1:50								20	1.5	1.0	59.8
65		R-5 60.0 - 65.0	31	52	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, very close fracture spacing, laminated foliation at 60°; medium to coarse grained garnet throughout; quartz vein 1/4" thick at 61.1' and 60°; brown sandy deposit < 1/16" in fracture at 60.2'; brown clayey silt and fine sand deposits < 1/16" in fractures at 60.85' and 61.4'; gray fine sand and fine fissiles in fracture at 62.3'	III	R2	30	1.5	2.0	60.2
									60★	1.5	1.0	60.55
									60★	1.5	3.0	60.85
65		R-5 60.0 - 65.0	31	52	13	Gray, fine to medium grained SCHIST, weak, moderately weathered, very close fracture spacing, laminated foliation at 60°; medium to coarse grained garnet throughout; quartz vein 1/4" thick at 61.1' and 60°; brown sandy deposit < 1/16" in fracture at 60.2'; brown clayey silt and fine sand deposits < 1/16" in fractures at 60.85' and 61.4'; gray fine sand and fine fissiles in fracture at 62.3'	III	R2	60★	1.5	1.0	61
									40	3.0	1.0	61.15
									30	3.0	1.0	61.25

PURPLE LINE CORING LOG PURPLE LINE CHEVY CHASE DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/13/08



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Jones 1**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
70	2:20	R-6 65.0 - 70.0	36	60	7	laminated foliation at 60°; trace medium grained garnet; 1/2" diameter quartz pocket at 65.0'	III	R2/R3	60★	1.5	3.0	61.4
	2:30								60★	1.5	1.0	61.6
	4:00								60★	1.5	1.0	61.8
	5:11								60★	1.5	1.0	62
	2:24								60★	1.5	3.0	62.8
75	12:35/4ft	R-7 70.0 - 75.0	38	63	23	Gray, fine to medium grained SCHIST, weak to medium strong, moderately weathered, close fracture spacing, laminated foliation at 60°; trace coarse grained garnet; gray clayey silt and fine sand < 1/16" in fractures at 70.8' and 71.0'; white and orange sand < 1/8" in fracture at 72.7'	III	R2/R3	60★	1.5	1.0	65.3
									60★	1.5	1.0	65.5
									60★	1.5	1.0	65.7
									60★	1.5	1.0	65.9
									60★	1.5	1.0	66
80	n/r	R-8 75.0 - 80.0	30	50	0	Gray, fine to medium grained SCHIST, weak, highly to moderately weathered, very close fracture spacing, laminated foliation at 60° except less pronounced 76.4-77.6'; quartz vein 3/4" thick at 76.9' and 50°; orange sand deposit < 1/16" in fracture at 75.9'	III/IV	R2	50	1.5	1.0	66.15
									60★	1.5	1.0	66.3
									60★	1.5	1.0	66.7
									60★	1.5	1.0	66.9
									60★	1.5	1.0	67.1
85		R-8 75.0 - 80.0	30	50	0	Steady loss of water during all runs. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.			30	3.0	1.0	67.35
									60★	1.5	1.0	67.5
									60★	1.5	1.0	67.75
									40	1.5	1.0	70.55
									60★	1.5	3.0	70.8
90		R-8 75.0 - 80.0	30	50	0	Steady loss of water during all runs. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.			60★	1.5	3.0	71
									60★	1.5	1.0	71.25
									60★	1.5	1.0	71.3
									60★	1.5	1.0	71.65
									60★	1.5	1.0	71.7
95		R-8 75.0 - 80.0	30	50	0	Steady loss of water during all runs. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.			60★	1.5	1.0	71.85
									60★	1.5	1.0	72.3
									60★	1.5	1.0	72.55
									35	1.5	2.0	72.7
									60★	1.5	1.0	72.85
100		R-8 75.0 - 80.0	30	50	0	Steady loss of water during all runs. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.			60★	1.5	1.0	72.95
									35	1.5	1.0	75.2
									60★	1.5	1.0	75.3
									60★	1.5	1.0	75.5
									25	1.5	1.0	75.7
		R-8 75.0 - 80.0	30	50	0	Steady loss of water during all runs. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.			20	3.0	2.0	75.9
									60★	1.0	6.0	76.3
									20	3.0	1.0	76.6
									30	1.5	1.0	76.95
									30	1.5	1.0	77.05
		R-8 75.0 - 80.0	30	50	0	Steady loss of water during all runs. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.			30	1.5	1.0	77.2
									30	1.5	1.0	77.3
									★ parallel to foliation			80



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BORING LOG

BORING NUMBER: **Jones 2**

SHEET NUMBER: 1 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and
Jones Bridge Rd intersection**

COORD. N: **1,293,658.0** E: **484,867.0**






STN. NO.: OFFSET:

SURFACE ELEV.: **260.7 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/17/07** TIME: **12:00 pm**

FINISH DATE: **5/17/07** TIME: **2:30 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		2"				3"					
Hammer Wt.		24"				5"					
Hammer Fall		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
Depth Elev.													
5			S	1		0.0 - 2.0	7	11	15	16	16	0	Dry, medium dense, brown, fine SAND, little rounded and subrounded Gravel, little Silt, trace roots, trace cinders (SM) (FILL)
			S	2		2.0 - 4.0	10	8	10	10	4		Dry, medium dense, brown, fine to medium SAND, little Silt (SM) (FILL)
			S	3		4.0 - 6.0	4	3	3	2	16		S-3A (Top 13 inches): Damp, medium stiff, brown, SILT, trace fine Sand, trace mica (ML) (FILL) Pocket penetrometer: 1.5tsf
			S	4		6.0 - 8.0	2	4	3	2	8		S-3B (Bottom 3 inches): Damp, loose, light brown, fine SAND, little Silt (SM) (FILL)
			S	5		8.0 - 10.0	4	5	3	4	14		Dry, loose, mottled brown and dark brown, fine to coarse SAND and clayey Silt, trace cinders, trace glass fragments (SM) (FILL) Same as S-4 (SM) (FILL)
10													
15			S	6		13.5 - 15.0	5	7	7		17		Same as S-4, trace subangular Gravel, trace cinders, trace mica (SM) (FILL)
20			S	7		18.5 - 20.0	4	6	6		8		Same as S-4, trace subangular Gravel, trace glass fragments (SM) (FILL)
			S	8		23.5 - 25.0	12	50/3"			6	23.5	Damp, very dense, mottled brown and white, fine to coarse SAND, some Silt, trace fine Gravel, trace mica (SM)
												237.2	



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BORING LOG

(continued)

BORING NUMBER: **Jones 2**

SHEET NUMBER: 2 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS			
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)				
							CORING								
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.			
30			S	9		28.5 - 30.0	36	50/3"			9		Same as S-8 (SM)		
35			S	10		33.5 - 35.0	50/2"				2		Water encountered during drilling at 33' Same as S-8 (SM)		
40			S	11		38.5 - 40.0	50/2"				2		Moist, very dense, brown, fine to coarse SAND, little Silt, trace mica (SM)		
													41.5 219.2	Auger refusal and coring begun at 41.5'	
45															
50															
55															



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CORING LOG

BORING NUMBER: **Jones 2**

SHEET NUMBER: **3** of **3**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Chevy Chase, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **South of Jones Mill Rd and Jones Bridge Rd intersection**

COORD. N: **1,293,658.0** E: **484,867.0**

STN. NO.: OFFSET:

DRILLER: **J. Sies**
INSPECTOR: **C. Nicholson**

SURFACE ELEV.: **260.7 feet**

DATUM: **Not surveyed/Approx. locations**

DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

START DATE: **5/17/07** TIME: **12:00 pm**

FINISH DATE: **5/17/07** TIME: **2:30 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"							
O.D.:	3"							
I.D.:	2"							
CASING SIZE:	" (")							

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	3:10	R-1 41.5 - 45.5	19	40	0	Gray, fine to coarse grained SCHIST, very weak, highly to moderately weathered, very close fracture spacing, laminated foliation at 50°; 1/4" thick white band at 42.6'.	IV/III	R1	50★	3	2.0	41.6
	1:35								50★	3	2.0	41.75
	2:04								50★	1.5	2.0	42
	3:10								50★	1.5	2.0	42.1
	3:10								50★	1.5	2.0	42.3
50	3:10	R-2 45.5 - 50.5	44	73	25	Gray, fine to coarse grained SCHIST, medium strong, moderately weathered, very close fracture spacing, laminated foliation between 30° and 40° except swirly bedding between 47.2' and 47.65'; quartz vein 2" thick at 45.6' and 3/4" vein at 47.0' and 30° opposite bedding, 1/2-1.0" quartz lenses 45.65-46.0' and 47.8-48.0'; orange and brown surface staining in all fractures between 46.0' and 47.1'	III	R3	50★	1.5	2.0	42.4
	3:10								50★	1.5	2.0	42.5
	2:45								50★	1.5	2.0	42.6
	7:00**								50★	1.5	2.0	42.7
	2:10**								0	1.0	0.75	45.65
	2:05**								30★	1.5	1.0	46
	** down pressure not constant								30★	1.5	1.0	46.3
									30★	1.5	1.0	46.4
									30★	1.5	1.0	46.55
									30★	1.5	1.0	46.7
									30★	1.5	1.0	47.1
									0	3	1.0	47.2
									0	3	1.0	47.35
									40★	1.5	1.0	47.65
	55											
						40★	1.5	1.0	48.3			
						40★	1.5	1.0	48.35			
						40★	1.5	1.0	48.9			
						40★	1.5	1.0	49.05			
60								★ parallel to foliation				50.5
65												

PURPLE LINE CORING LOG PURPLE LINE CHEVY CHASE DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/13/08



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BORING LOG

BORING NUMBER: **Jones 2A**

SHEET NUMBER: **1** of **3**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and
Jones Bridge Rd intersection**

COORD. N: **1,293,663.0** E: **484,868.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **260.7 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/21/07** TIME: **12:20 pm**

FINISH DATE: **5/23/07** TIME: **9:30 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■	U □	P □	G □	C □	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	5/21/07	8:30 am	27.0	45.5	45.5
Length		24"				5"	5/25/07	9:30 am	29.0	0.0	45.5
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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BORING LOG

(continued)

BORING NUMBER: Jones 2A

SHEET NUMBER: 2 of 3

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Chevy Chase, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]



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CORING LOG

BORING NUMBER: **Jones 2A**

SHEET NUMBER: 3 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and
Jones Bridge Rd intersection**

COORD. N: **1,293,663.0** E: **484,868.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **260.7 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/21/07** TIME: **12:20 pm**

FINISH DATE: **5/23/07** TIME: **9:30 am**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
5/21/07	8:30 am	27.0	45.5	45.5
5/25/07	9:30 am	29.0	0.0	45.5

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
50	2:10 2:18 3:00 6:51/2ft	R-1 45.5 - 50.5	24	40	7	Gray, fine to coarse grained SCHIST, weak, highly weathered, very close fracture spacing, laminated foliation at 50°; quartz vein 1" thick at 50.0' Casing sunk 6 inches while coring.	III	R2	0 50★ 1.5 50★ 1.5 50★ 3 50★ 1.5	3 1.5 1.5 2.0 1.5	1.0 1.0 1.0 2.0 1.0	48.85 49.1 49.35 49.5 49.85 50.5
55						After R--1, hole caved below 45.5 feet. attempts to re-advance hole to 50.5 unsuccessful due to cave-in below augers. Hole terminated at 50.5 feet and offset. See log for Jones 2-B. Coring down pressure and rotations per minute not recorded. Boring backfilled with auger cuttings. Site restored with seed and straw.		★ parallel to foliation				
60												
65												
70												



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BORING LOG

BORING NUMBER: **Jones 2B**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and
Jones Bridge Rd intersection**

COORD. N: **1,293,668.0** E: **484,869.0**






STN. NO.: OFFSET:

SURFACE ELEV.: **260.7 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/24/07** TIME: **8:15 am**

FINISH DATE: **5/24/07** TIME: **2:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	6/14/07	6:30 am	206.7	-	81.0
Length		24"				5"	7/10/07	3:00 pm	206.1	-	81.0
Hammer Wt.		140lbs	Drill Rod Size				7/18/07	12:00 pm	205.9	-	81.0
Hammer Fall		30"	I.D. (O.D.)				7/20/07	12:30 pm	205.7	-	81.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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BORING LOG

(continued)

BORING NUMBER: Jones 2B

SHEET NUMBER: **2** of **5**

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Chevy Chase, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]



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CORING LOG

BORING NUMBER: **Jones 2B**

SHEET NUMBER: 3 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of Jones Mill Rd and
Jones Bridge Rd intersection**

COORD. N: **1,293,668.0** E: **484,869.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **260.7 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **5/24/07** TIME: **8:15 am**

FINISH DATE: **5/24/07** TIME: **2:00 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"			6/14/07	6:30 am	206.7	-	81.0
O.D.:	3"			7/10/07	3:00 pm	206.1	-	81.0
I.D.:	2"			7/18/07	12:00 pm	205.9	-	81.0
CASING SIZE:	" (")			7/20/07	12:30 pm	205.7	-	81.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
40	2:45	R-1 36.0 - 41.0	26	43	0	Brown, fine to coarse SAND, some silt, trace mica (completely weathered rock) and brownish gray, fine grained SCHIST, extremely weak, highly to completely weathered, extremely close fracture spacing; bedding not discernable; fractures at 30° with brown, micaceous clayey silt infill and orange and black staining; 1" quartz pockets at 37.5-38.0'	V/IV	R0				
	2:38											
	2:07											
	2:13											
	2:40											
45	1:43	R-2 41.0 - 46.0	39	65	0	Brown, fine to coarse SAND, some silt, trace mica (completely weathered rock) and brownish gray, fine to medium grained SCHIST, very weak, highly to moderately weathered, extremely close fracture spacing, laminated foliation at 40°	IV/III	R1				
	1:49											
	1:39											
	1:40											
	2:00											
50	3:55/2ft	R-3 46.0 - 51.0	34	57	0	Brownish gray, fine to coarse grained SCHIST, very weak, highly to moderately weathered, extremely close fracture spacing, very thin foliation at 40°; fractures between 0° and 40° parallel to bedding with brownish gray clayey silty sand infill	IV/III	R1				
	2:06											
	3:05**											
	4:00**											
	2:45											
55	3:30**	R-4 51.0 - 56.0	16	27	7	Gray, fine to coarse grained SCHIST, medium strong, highly weathered, extremely close fracture spacing, very thin foliation at 35-45°; fine silty sand < 1/4" in fractures at 51.2', 51.5', 51.65', 51.8', and 51.9'; mottled vari-colored fine to coarse sand, little clayey silt, trace mica 52.0-52.4'	IV	R3	30★	1.5	3.0	51.2
	3:23**								50	1.5	1.0	51.25
	2:43**								30★	3	2.0	51.5
	4:25**								40★	3	2.0	51.65
									45★	3	2.0	51.8
60		R-5 56.0 - 61.0	36	60	23	Gray, fine to coarse grained SCHIST, strong, moderately weathered, close fracture spacing, laminated foliation at 40-50°; vein < 1/2" thick of white grains and coarse grained garnet at 58.7' and 40°	III	R4	35★	3	2.0	51.9
	1:55											
	2:30											
	2:59								10	1.5	1.0	58.45
	3:16								40★	1.5	1.0	58.65
	3:04**								40★	1.5	1.0	59
									50★	1.5	1.0	59.4

PURPLE LINE CORING LOG PURPLE LINE CHEVY CHASE DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/13/08



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Jones 2B**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA										
									ANGLE (deg)	Jr	Ja	DEPTH (feet)							
65	2:10	R-6 61.0 - 66.0	29	48	13	Gray, fine to coarse grained SCHIST, strong, moderately weathered, very close fracture spacing, laminated foliation at 30-50°; coarse grained green minerals throughout; 1/4-1" quartz pockets at 6" spacing	III	R4	20	1.5	1.0	59.75							
	20								1.5	1.0	60.05								
	50★								1.5	1.0	60.3								
	80								1.5	1.0	60.45								
	40★								3	1.0	60.6								
	20								3	1.0	60.8								
	30★								1.5	1.0	61.15								
	30★								1.5	1.0	61.25								
	30								3	1.0	61.55								
	30								3	1.0	61.7								
70	2:07	R-7 66.0 - 71.0	60	100	48	Gray, fine to coarse grained SCHIST, strong, slightly weathered, close fracture spacing, laminated foliation at 40°; trace medium to coarse grained garnet; coarse grained green minerals throughout; 1/2-1" quartz pockets at 68.2', 69.3', and 69.7'	II	R4	30★	3	1.0	62							
	30								3	1.0	62.15								
	30								3	1.0	62.3								
	30★								3	1.0	62.7								
	20★								1.5	1.0	62.85								
	30								1.5	1.0	63.1								
	30								3	1.0	63.2								
	0								1.5	1.0	66.15								
	10								1.5	1.0	66.2								
	40★								1.5	1.0	66.5								
75	2:41	R-8 71.0 - 76.0	42	70	40	Gray, fine to coarse grained SCHIST, strong, moderately weathered, close fracture spacing, laminated foliation at 30-40°; trace medium grained garnet; coarse grained green minerals throughout; 40° healed fractures between 71.6' and 71.9' and 90° healed fractures between 72.0' and 72.5'	III	R4	40★	1.5	1.0	66.85							
	40★								1.5	1.0	67								
	40★								1.5	1.0	67.1								
	40★								1.5	1.0	67.2								
	40★								1.5	1.0	67.3								
	40★								1.5	1.0	67.6								
	40★								1.5	1.0	68.3								
	40★								1.5	1.0	68.6								
	40★								1.5	1.0	69								
	20								1.5	1.0	69.35								
80	2:26	R-9 76.0 - 81.0	51	85	32	Gray, fine to coarse grained SCHIST, strong, moderately weathered, close fracture spacing, laminated foliation at 30°; coarse grained green deposits throughout	III	R4	75	1.5	1.0	69.6							
	40★								1.5	1.0	69.95								
	30								1.5	1.0	70.4								
	30★								1.5	1.0	70.8								
	30★								1.5	1.5	71.2								
	30★								1.5	1.0	71.4								
	30★								1.5	1.0	72.05								
	30★								1.5	1.0	72.5								
	30★								1.5	1.0	72.65								
	30★								1.5	1.0	73.2								
85		not constant				Coring down pressure and rotations per minute not recorded. Well installed with 10' screen 68-78' and sealed with bentonite upon completion. See separate appendix for well installation log. Site restored with seed and straw.			30★	1.5	1.0	73.7							
	30★								1.5	1.0	73.9								
	30								1.5	1.0	74								
	30★								1.5	1.0	74.3								
	30★								1.5	1.0	74.9								
	30★								1.5	1.0	76.2								
	90								1.5	1.0	76.3								
	30★								1.5	1.0	76.4								
	30★								1.5	1.0	76.75								
	30								3	1.0	76.9								
30★	1.5								1.0	77.15									
30★	1.5								1.0	77.3									
30★	1.5								1.0	77.5									
30★	1.5								1.0	78.1									
30★	1.5								1.0	78.4									
30★	1.5								1.0	78.55									
30★	1.5								1.0	78.8									
90																30★	1.5	1.0	78.8
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
95																30★	1.5	1.0	78.8
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	
	30★															1.5	1.0	78.8	



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Jones 2B**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Chevy Chase, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
100									30★	1.5	1.0	79
									30★	1.5	1.0	79.2
									30★	1.5	1.0	79.3
									30★	1.5	1.0	79.4
									30★	1.5	1.0	79.9
								★ parallel to foliation				81
105												
110												
115												
120												
125												
130												

PURPLE LINE CORING LOG PURPLE LINE CHEVY CHASE DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/13/08



Appendix G

Chevy Chase Rock Core Photographs

Jones 1



Jones 1 from 41.5 ft to 70.0 ft in box 1 of 2 (shown dry and wet)



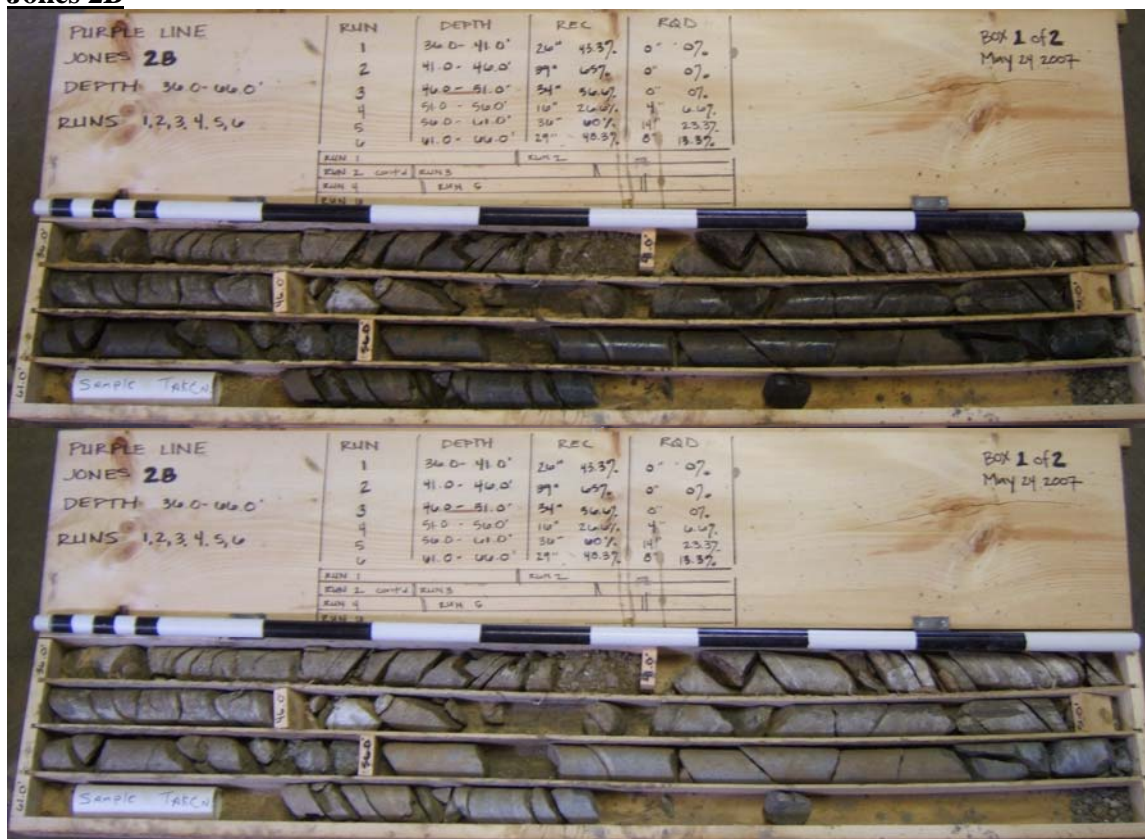
Jones 1 from 70.0 ft to 80.0 ft in box 1 of 2 (shown dry and wet)

Jones 2 and Jones 2A



Jones 2 from 41.5 ft to 50.5 ft and Jones 2A from 45.5 ft to 50.5 ft in box 1 of 1 (shown dry and wet)

Jones 2B



Jones 2B from 36.0 ft to 66.0 ft in box 1 of 2 (shown dry and wet)

Purple Line
Chevy Chase, Maryland
Rock Core Photographs



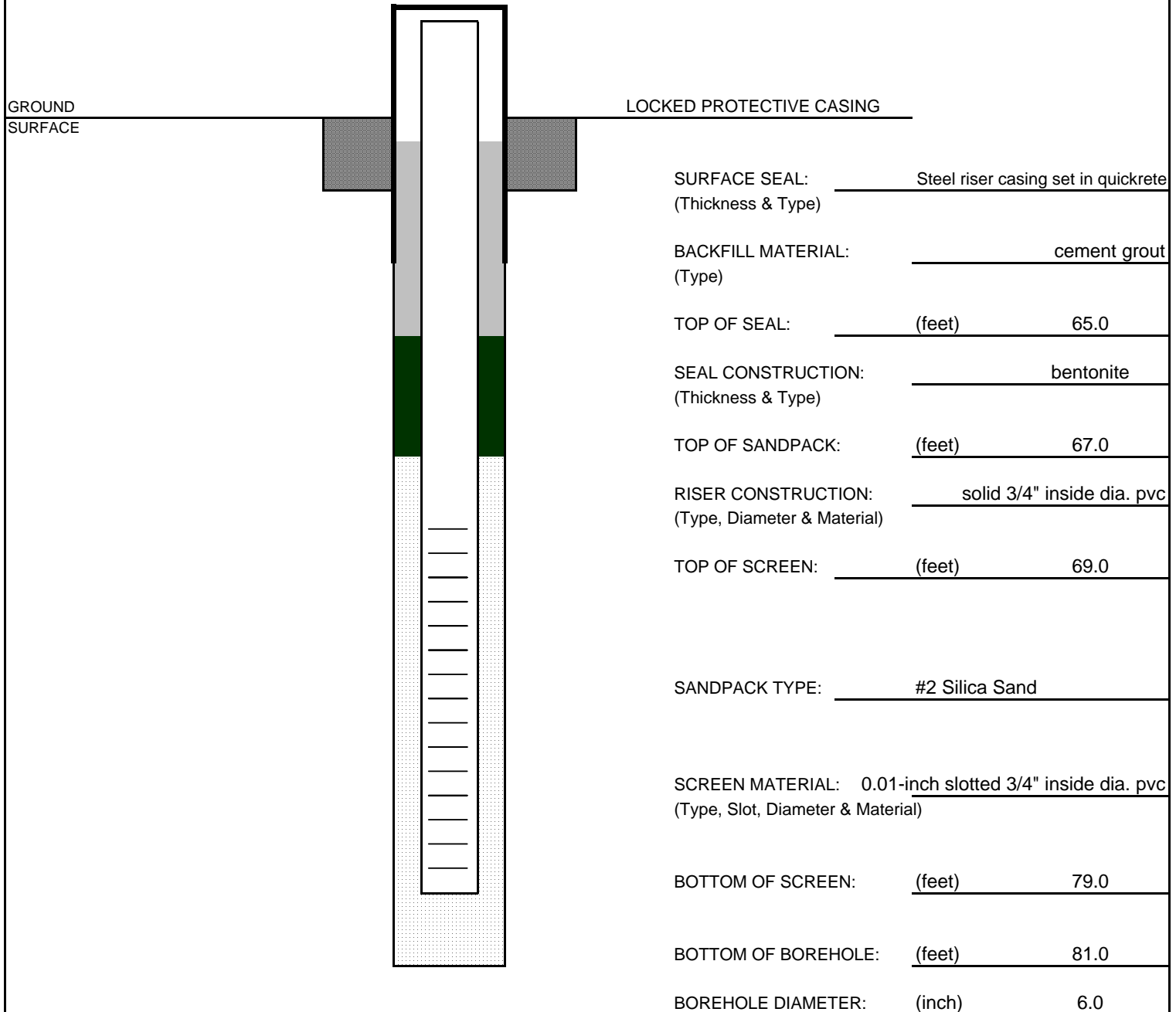
Jones 2B from 66.0 ft to 81.0 ft in box 2 of 2 (shown dry and wet)



Appendix H
Chevy Chase Groundwater
Observation Well Construction Logs
and Readings

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Jones 2B
Project Name:	Purple Line	Driller:	J. Sies	Date Installed:	5/25/2007
Project Location:	Silver Spring, MD	Ground EL:	260.7 (feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	263.2 (feet)	Page:	1 of 1



Remarks:

Purple Line for Bi-County Transitway

Wells installed by E2CR, Inc.

Boring/ Well No. Date Installed	Jones 2B 5/25/2007		
	Casing Stick up	Ground Surface El.	Top of Casing El.
	2.51	260.7	263.21

Water Readings

Date	Depth from top of casing	Depth from Surface	Ground Water El.
6/14/2007	31	28.5	232.2
7/10/2007	31.61	29.1	231.6
7/18/2007	31.85	29.3	231.4
7/20/2007	32	29.5	231.2
7/25/2007	32.5	30.0	230.7
8/22/2007	33.1	30.6	230.1
8/27/2007	35	32.5	228.2
12/13/2007	35.8	33.3	227.4
12/19/2007	25.6	30.2	230.5

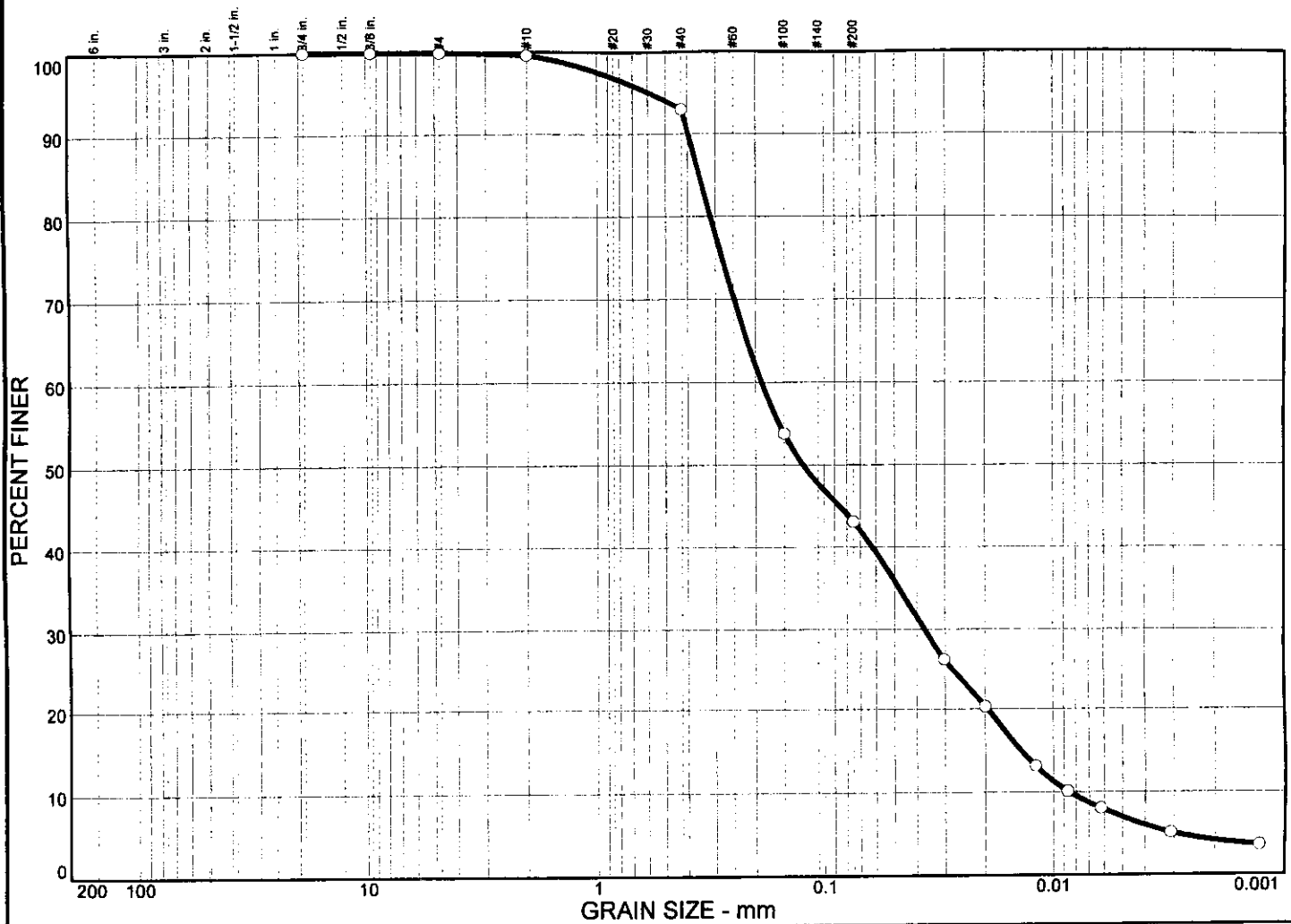


Appendix I

Chevy Chase

Soil Laboratory Test Data

Particle Size Distribution Report



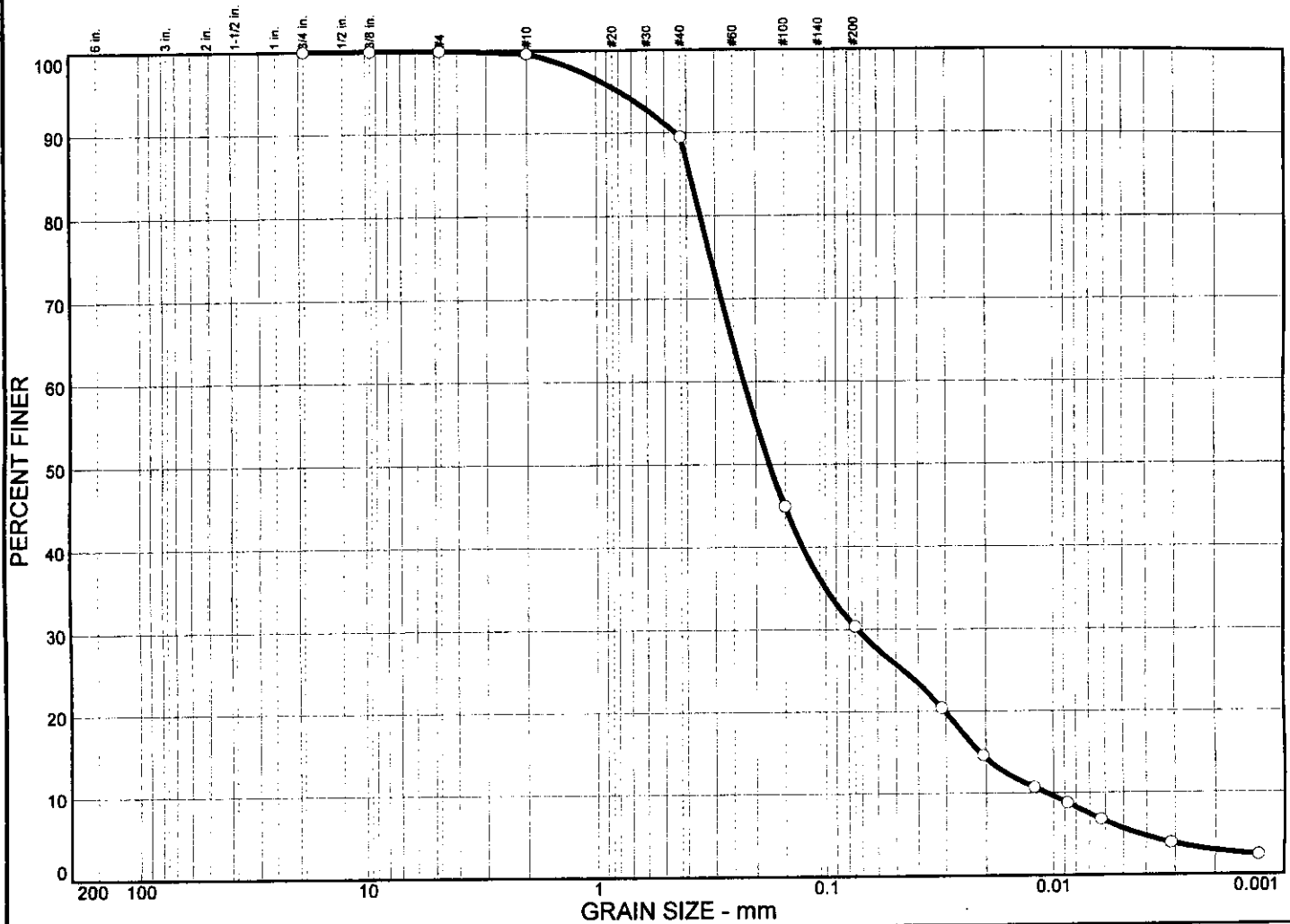
	% COBBLES	% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	0.0		56.9				36.1		7.0	
×	LL ,	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	0.354	0.188	0.124	0.0370	0.0138	0.0086	0.85	21.95	

MATERIAL DESCRIPTION								USCS	AASHTO
Greenish Brown, F-M SAND and SILT, trace Clay and Mica								SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line		Remarks: Natural Moisture = 22.2%
Source: Jones 1	Sample No.: S-3 Elev./Depth: 4.0'-6.0'	
Particle Size Distribution Report E2CR, Inc.		

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	0.0		69.6				24.7		5.7	
×	LL -	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	0.387	0.225	0.175	0.0728	0.0213	0.0107	2.19	20.93	
MATERIAL DESCRIPTION									USCS	AASHTO	
○ Greenish Brown, Silty F-M SAND, trace Clay and Mica									SM		

Project No. 07503-04 Client: Mayland Transit Administration

Project: Purple Line

Source: Jones I

Sample No.: S-6

Elev./Depth: 13.5'-15.0'

Remarks:

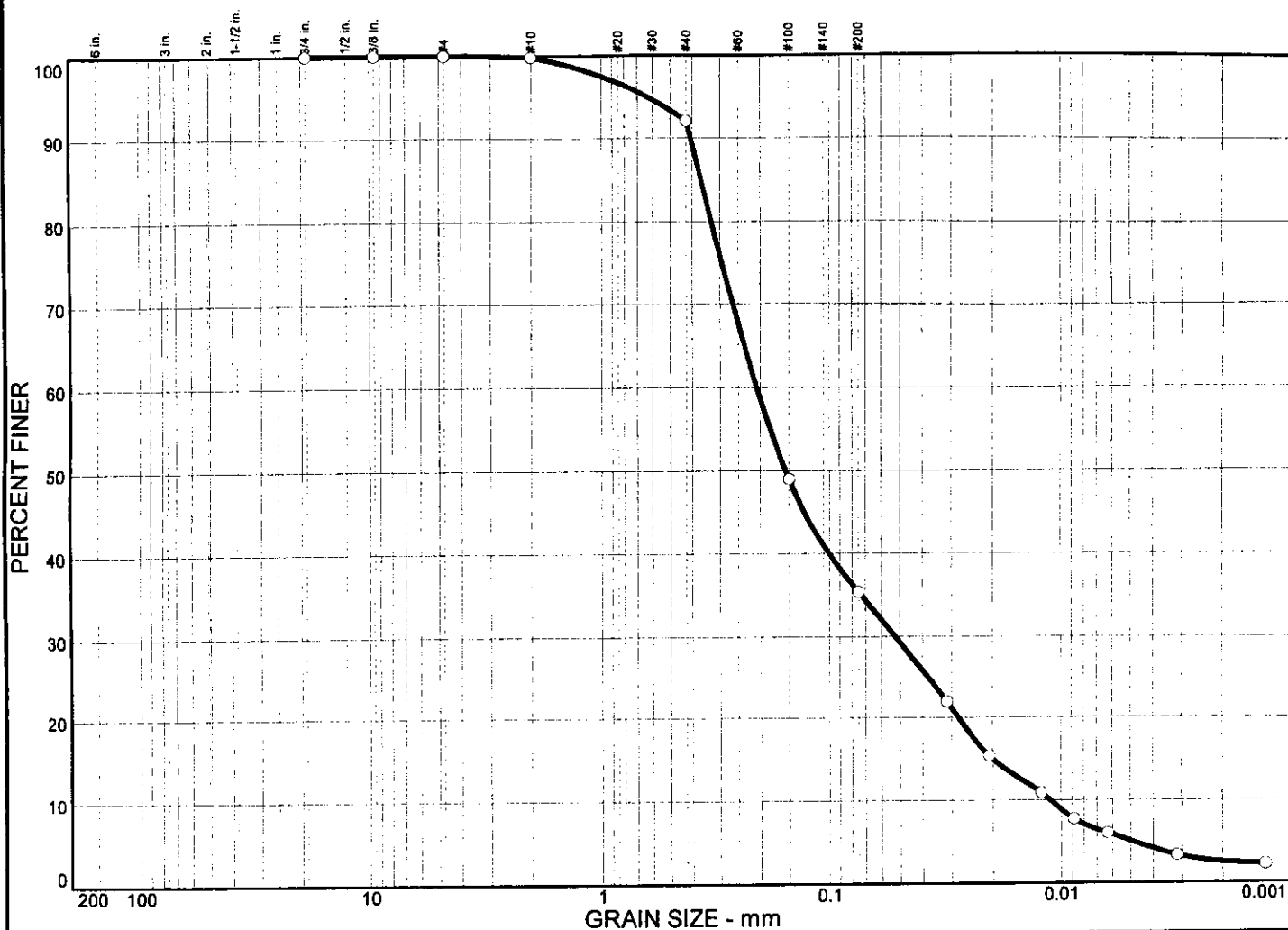
Natural Moisture = 22.2%

Particle Size Distribution Report

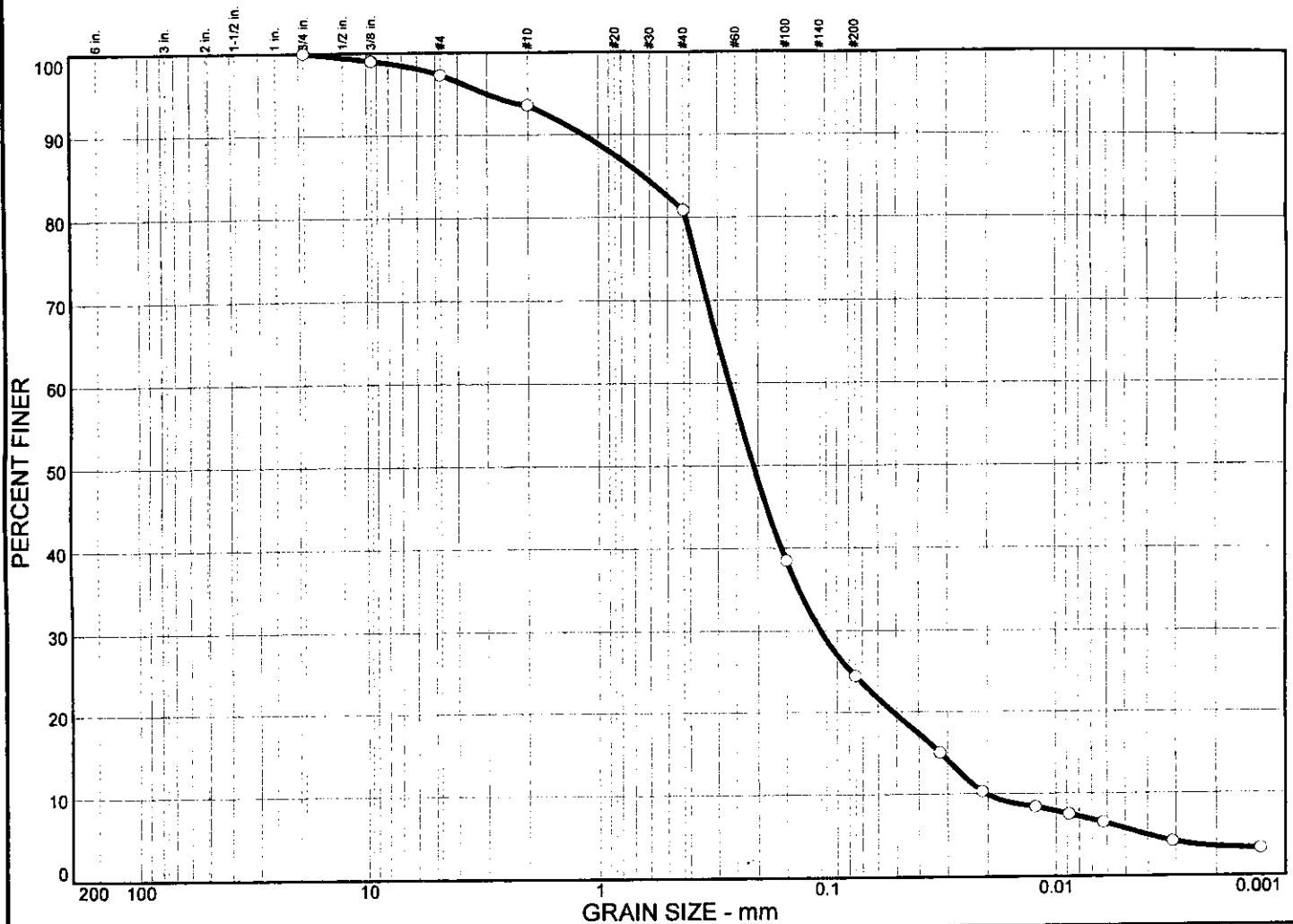
E2CR, Inc.

Figure

Particle Size Distribution Report



Particle Size Distribution Report



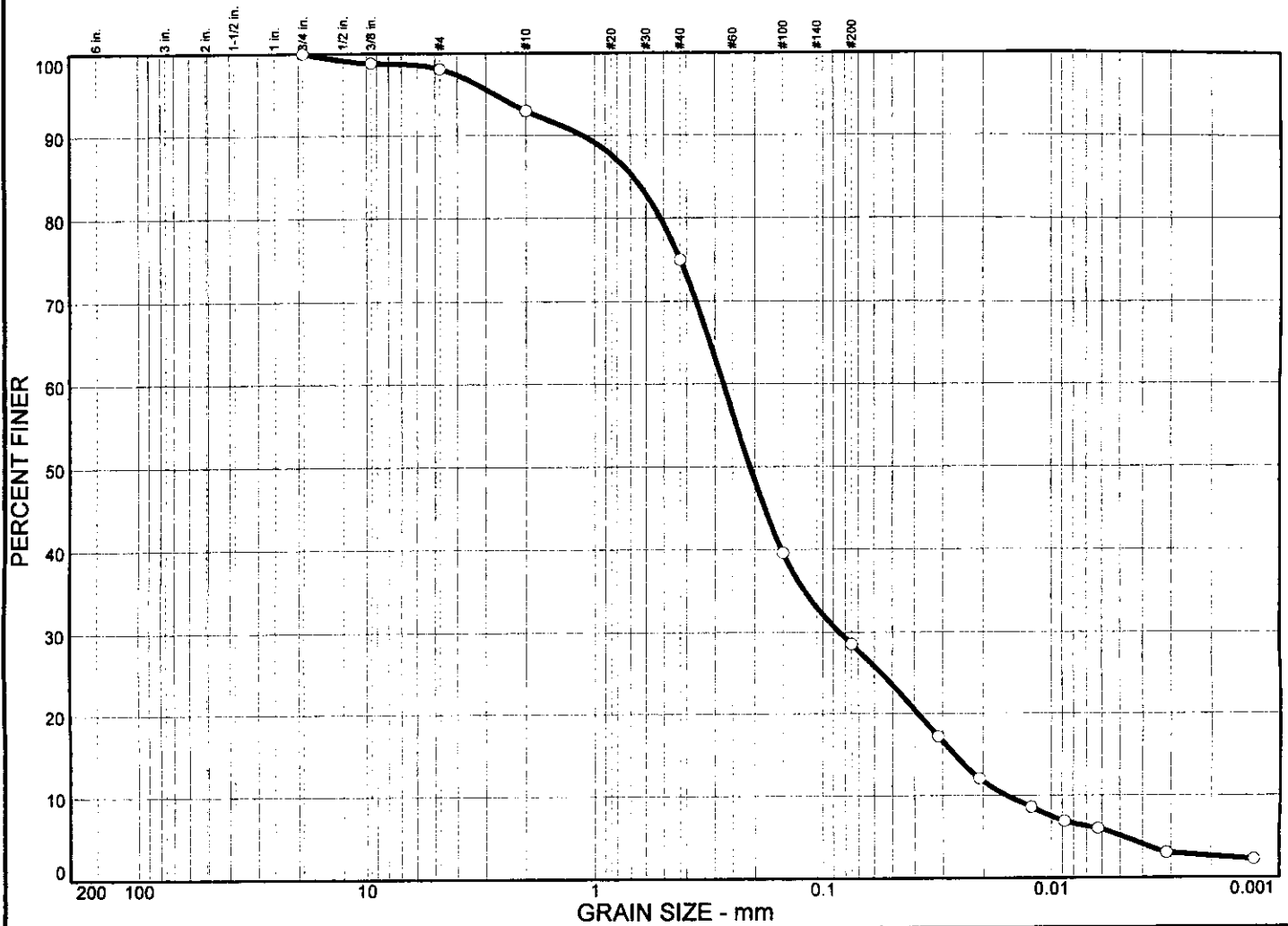
% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
0.0		2.7		72.9				18.7		5.7	
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u		
NP	NP	0.639	0.267	0.209	0.106	0.0324	0.0203	2.07	13.17		

MATERIAL DESCRIPTION								USCS	AASHTO
Tan, Greenish Brown, Silty F-M SAND, trace Clay and Mica, DRF								SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line			Remarks: Natural Moisture = 13.8%
Source: Jones 2	Sample No.: S-8	Elev./Depth: 23.5'-25.0'	
Particle Size Distribution Report E2CR, Inc.			

Figure

Particle Size Distribution Report



	% COBBLES	% GRAVEL		% SAND				% SILT	% CLAY	
○	0.0	1.9		69.5				23.5	5.1	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	NP	NP	0.682	0.275	0.209	0.0844	0.0267	0.0157	1.65	17.47

MATERIAL DESCRIPTION	USCS	AASHTO
Tan, Greenish Brown, Silty F-C SAND, trace Clay and Mica, DRF	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line <input type="radio"/> Source: Jones 2 Sample No.: S-9 Elev./Depth: 28.5'-30.0'	Remarks: <input type="radio"/> Natural Moisture = 11.5%
<div style="text-align: center;">Particle Size Distribution Report E2CR, Inc. </div>	

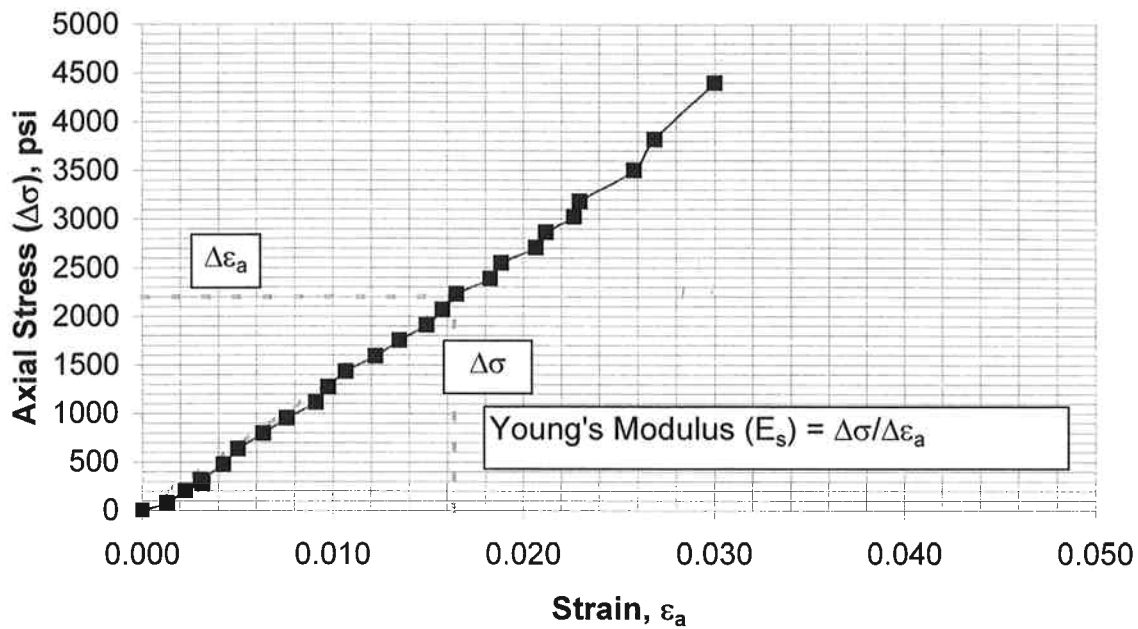
Figure



Appendix J

Chevy Chase

Rock Laboratory Test Data



Boring No.	Jones 1
Run No	RUN-4
Depth	57.5 FEET
Diameter, D	2.0 INCH
Length, L	3.1 INCH
L/D Ratio	1.6
Temperature During Testing	68 °F
Axial Stress at Failure	4400 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.35E+05	PSI
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Description:

Sketch at Failure:



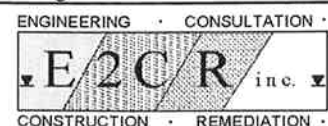
Project Name: Purple Line, Chevy Chase, MD

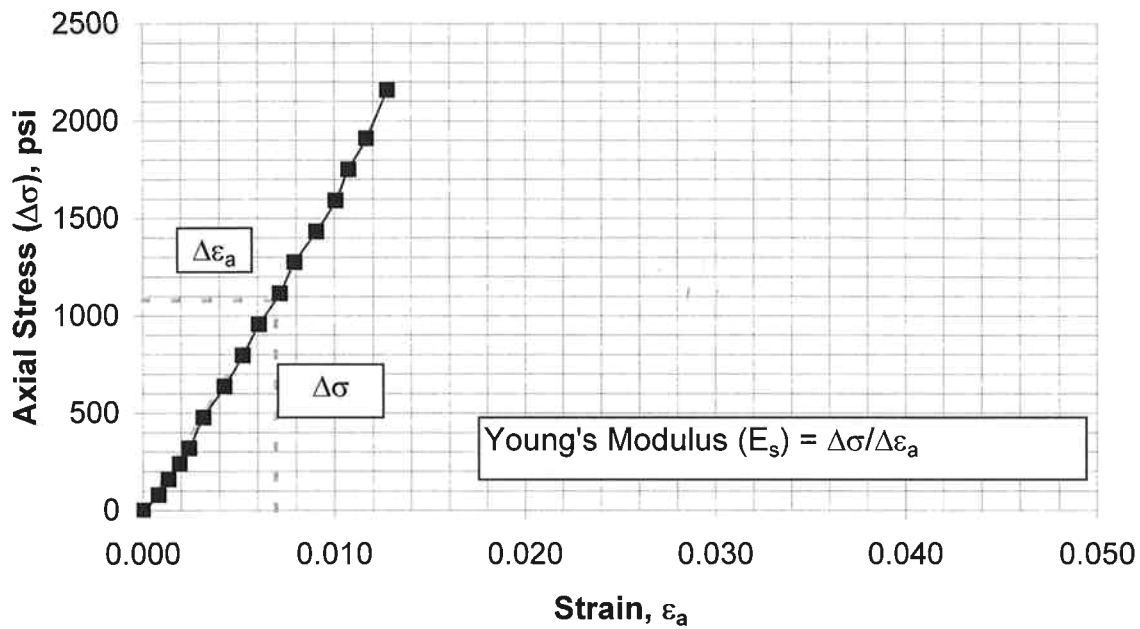
Date: 6/18/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Jones 2
Run No	RUN-2
Depth	47 FEET
Diameter, D	2.0 INCH
Length, L	3.5 INCH
L/D Ratio	1.8
Temperature During Testing	68 °F
Axial Stress at Failure	2160 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.56E+05	PSI
---	----------	-----

Description:

Sketch at Failure:



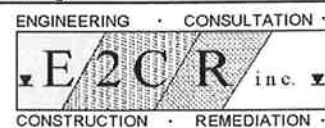
Project Name: Purple Line, Chevy Chase, MD

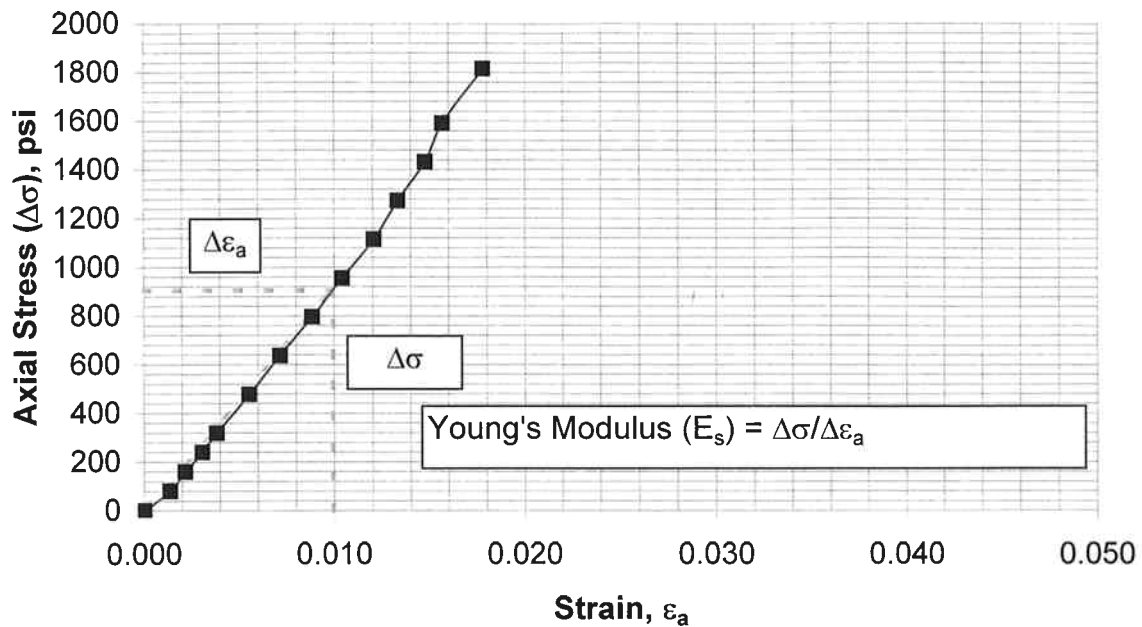
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Jones 2
Run No	RUN-6
Depth	61 FEET
Diameter, D	2.0 INCH
Length, L	3.1 INCH
L/D Ratio	1.6
Temperature During Testing	68 °F
Axial Stress at Failure	1810 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	9.12E+04	PSI
---	----------	-----

Description:

Sketch at Failure:



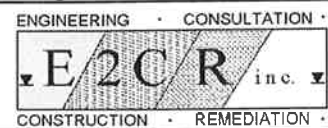
Project Name: Purple Line, Chevy Chase, MD

Date: 6/11/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Appendix K

Silver Spring Boring Logs

BORING LOG

BORING NUMBER: Manchester 1

SHEET NUMBER: 1 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Silver Spring, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: E. Hill

INSPECTOR: C. Nicholson

DRILLING METHOD: Hollow Stem Auger

RIG TYPE: Ford F700 truck mounted CME 55 with automatic hammer

LOCATION: Grass between sidewalk and Manchester Road

COORD. N: 485,258.5 E: 1,309,744.5






STN. NO.: OFFSET:

SURFACE ELEV.: 243.7 feet

DATUM: NAD 83/91 and NAVD 88

START DATE: 3/23/07 TIME: 9:00 am

FINISH DATE: 3/26/07 TIME: 12:45 pm

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
		1.375"				2"					
		2"				3"					
		24"				5'					
		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
5			S	1		0.0 - 2.0	2	3	7	10	14	0	0-0.16' Topsoil
			S	2		2.0 - 4.0	6	16	24	36	14	243.54	Damp, loose, orangish brown, fine to coarse SAND, some Silt, trace fine Gravel, trace mica (SM) Same as S-1, dense (SM)
			S	3		4.0 - 6.0	20	20	28	30	22		Same as S-1, dense (SM)
			S	4		6.0 - 8.0	14	18	24	28	8		Same as S-1, dense (SM)
			S	5		8.0 - 10.0	25	28	50/3"		14		Damp, very dense, brown, fine to coarse SAND, some Silt, trace fine Gravel, trace mica (SM)
15			S	6		13.5 - 13.9	50/5"				5		Same as S-5 (SM)
			S	7		18.5 - 19.4	18	50/5"			6		Same as S-5 (SM)
			S	8		23.5 - 24.4	12	50/5"			5		Same as S-5, grayish brown (SM)



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **Manchester 1**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
30			S	9		28.5 - 28.8	50/3"					3	Same as S-5, grayish brown (SM)
35			S	10		33.5 - 33.7	50/2.5"					2.5	Same as S-5, grayish brown (SM)
40			S	11		38.5 - 38.9	50/5"					3	Same as S-5, light brown (SM)
45			S	12		43.5 - 43.7	50/2"					2	Damp, very dense, light brown, fine SAND and micaceous Silt (SM)
50			S	13		48.5 - 48.5	50/0"					0	No recovery Auger chatter at 49.0'. 50.5 193.2 Auger refusal and coring begun at 50.5'.
55													



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CORING LOG

BORING NUMBER: **Manchester 1**
SHEET NUMBER: **3** of **4**
PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**
DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Grass between sidewalk and Manchester Road**
COORD. N: **485,258.5** E: **1,309,744.5**
STN. NO.: OFFSET:
SURFACE ELEV.: **243.7 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **3/23/07** TIME: **9:00 am**
FINISH DATE: **3/26/07** TIME: **12:45 pm**

CORE BARREL DATA:	NOTES:	GROUNDWATER DATA				
TYPE: NX		Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE: 2"		3/26/07	2:45 pm	20.2	50.0	90.0
O.D.: 3"						
I.D.: 2"						
CASING SIZE: " (")						

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
55	1:55	R-1 50.5 - 55.0	54	100	69	Gray, fine to coarse grained GNEISS, medium strong, unweathered, very close to moderate fracture spacing; no apparent foliation; medium grained garnet throughout; high angle healed fractures 50.5-51.4' with 80° and 30° intersecting at 50.95' and 50° at 51.05' Water loss at 50.5'	I	R3	85	3	2.0	50.9
	1:45								45	1.5	2.0	51.4
	1:50								20	1.5	1.0	51.9
	n/r*								40	3	2.0	52.2
	n/r								40	3	1.0	52.6
	n/r	R-2 55.0 - 60.0	60	100	93	Same as R-1, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout and as large as 0.25" diameter between 58.7' and 59.2'; healed fractures of 50° at 55.9', 0° and 50° at 57.0', 30° at 58.6', 0° at 58.8' and 59.2', 70° at 59.3', and 40° at 59.6'	I	R3	30	3	2.0	52.7
	n/r								5	1.5	1.0	53.4
	n/r								70	1.5	2.0	53.5
	n/r								50	1.5	2.0	53.9
	n/r								20	1.5	1.0	54.3
60	n/r								20	1.5	1.0	54.6
	n/r								0	3	1.0	55.2
	n/r								40	1.5	2.0	56.2
	n/r								5	1.5	1.0	58.45
	1:59	R-3 60.0 - 65.0	60	100	83	Same as R-1, wide fracture spacing 60.0-63.5', very close to close fracture spacing 63.5-64.4', and moderate fracture spacing 64.4-65.0'; no apparent foliation; trace mica; coarse grained garnet throughout; 1" quartz pockets at 60.9', 62.0', and 63.0'; healed near vertical fracture from 64.5' to 65.0'; hard green and gold minerals in fracture at 60.4'; brown staining in fracture at 63.85'; green, clayey fine sand infill 63.85-64.2'	I	R3	0	1.5	2.0	59
	2:03								40	1.5	2.0	59.15
	2:12								60	1.5	2.0	60.4
	1:52											
	1:42								20	1.5	1.0	63.5
65	n/r	R-4 65.0 - 70.0	60	100	67	Same as R-1, close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; high angle healed fractures throughout with 70° at 65.4' and 70° from 67.4' to 67.8'; sand deposit < 1/16" at 65.65'; green stain in fracture at 66.3'	I	R3	0	1.5	1.0	63.7
	n/r								40	1.5	1.0	63.8
	n/r								0	1.0	5.0	63.85
	n/r								50	1.5	2.0	64.2
	n/r								60	1.5	1.0	64.4
70	n/r								60	3	2.0	65.65
	n/r								0	3	1.0	65.8
	n/r								70	1.5	1.0	66
	n/r								40	1.5	1.0	66.3
	1:33	R-5 70.0 - 75.0	60	100	88	Same as R-1, close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; quartz pockets < 0.5" throughout; healed fractures of 50° at 70.45', 70° at 70.65', 40° at 71.8', near vertical fracture at 73.15-73.5' and high and shallow angle healed fractures intersecting between 74.5' and 74.9'	I	R3	5	1.5	1.0	67.3
	1:47								10	1.5	2.0	68.2
	1:51								70	1.5	1.0	68.4
	2:00								0	3	1.0	68.6
	2:03								20	3	1.0	68.9
75									5	1.5	1.0	69.5
									10	1.5	1.0	69.65
									50	1.5	1.0	69.8
									10	1.5	1.0	70.3
									60	1.5	1.0	70.45



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CORING LOG

(continued)

BORING NUMBER: **Manchester 1**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
80	1:05	R-6 75.0 - 80.0	60	100	87	Same as R-1, close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; quartz pockets < 0.5" throughout, quartz lenses at 75.4' and 78.0', and 1" quartz pocket in center of core at 79.6'; healed fractures at 80° between 77.0' and 77.2', 20° at 78.0', and intersecting 50° and 80° at 78.45' with increased garnet content; gray clayey sand deposit < 1/16" in fracture at 75.5'; green stain in fractures at 75.6' and 77.25'	I	R4	60	1.5	1.0	70.65
	1:21								50	1.5	1.0	72.25
	1:34								10	1.5	1.0	74.1
	1:44								70	1.5	2.0	74.5
	1:58								20	1.5	2.0	75.5
	n/r	R-7 80.0 - 85.0	60	100	92	Gray, fine to coarse grained GNEISS, strong, unweathered, close to moderate fracture spacing; no apparent foliation except faint swirly bedding 82.75-85.0'; trace mica; coarse grained garnet as large as 0.25" in diameter throughout; 1" quartz vein at 80.15' and pockets at 80.35', 80.6', 83.5', and 83.7'; nearly vertical healed fractures from 80.3' to 80.8', 60° from 81.4' to 82.0', and nearly vertical from 83.1' to 83.4'	I	R4	20	3	1.0	75.6
	n/r								25	1.5	1.0	76.55
	n/r								40	1.5	1.0	77.25
	n/r								60	1.5	1.0	78.3
	n/r								0	1.5	1.0	79.6
85	1:42	R-8 85.0 - 90.0	60	100	100	Same as R-7; faint swirly bedding 85.0-90.0'; trace mica; coarse grained garnet as large as 0.25" diameter throughout; 0.75" thick quartz vein at 85.0' and quartz pockets throughout with 2" pockets at 86.9', 87.0', 87.5', 88.3', and 89.5'; healed fractures of 60° between 86.4' and 86.7' and 85° at 88.3'	I	R4	5	1.5	1.0	82.7
	1:34								0	1.5	1.0	84.55
	2:02								0	1.5	1.0	85.1
	1:59								5	1.5	1.0	85.8
	2:20								60	1.5	1.0	86.3
	* not recorded								0	1.5	1.0	86.4
									60	1.5	2.0	86.7
90						Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Site restored with seed and straw.			40	1.5	1.0	88.65
95												
100												
105												
110												



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BORING LOG

BORING NUMBER: **Manchester 2**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **M. Wrightson/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Intersection of Manchester and Reading Roads**

COORD. N: **484,923.2** E: **1,310,581.4**






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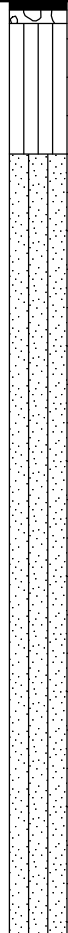









SURFACE ELEV.: **263.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/27/07** TIME: **9:15 am**

FINISH DATE: **3/28/07** TIME: **1:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	3/28/07	9:00 am	19.6	55.0	60.0
Length		24"				5'	4/2/07	6:35 am	13.4	-	90.0
Hammer Wt.		140lbs	Drill Rod Size				4/18/07	6:20 am	13.0	-	90.0
Hammer Fall		30"	I.D. (O.D.)				4/25/07	3:05 pm	12.8	-	90.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5			S	1		0.0 - 2.0	6	6	7	7	24	0	0-0.25' Asphalt Pavement
			S	2		2.0 - 4.0	8	10	10	13	0	0.25-0.6' Dry, brown, medium dense, well graded GRAVEL, some Sand (GP) (Pavement subbase)	
			S	3		4.0 - 6.0	7	10	12	18	24	262.8	Moist, stiff, brown, SILT, little fine Sand, trace Gravel, trace mica (ML)
			S	4		6.0 - 8.0	14	28	24	28	21	4	No recovery
			S	5		8.0 - 10.0	12	20	24	30	22	259.4	Moist, medium dense, grayish brown, fine to coarse SAND, some Silt, trace mica (SM)
			S	6		13.5 - 15.0	12	24	26		18		Moist, very dense, grayish brown, fine to coarse SAND, little Silt, trace fine Gravel, trace mica (SM)
			S	7		18.5 - 18.8	50/4"				4		Same as S-4 (SM)
			S	8		23.5 - 23.6	50/1"				0		No recovery



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BORING LOG

(continued)

BORING NUMBER: **Manchester 2**
SHEET NUMBER: 2 of 5
PROJECT NUMBER: **18005 A**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **M. Wrightson/C. Nicholson**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24		REC. (in.)	
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)		RQD %	
												25.5 237.9	Auger refusal and coring begun at 25.5'.
30													
35													
40													
45													
50													
55													

PURPLE LINE BORING LOG - PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
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CORING LOG

BORING NUMBER: **Manchester 2**

SHEET NUMBER: 3 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **M. Wrightson/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Intersection of Manchester and Reading Roads**

COORD. N: **484,923.2** E: **1,310,581.4**

STN. NO.: OFFSET:

SURFACE ELEV.: **263.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/27/07** TIME: **9:15 am**

FINISH DATE: **3/28/07** TIME: **1:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
3/28/07	9:00 am	19.6	55.0	60.0
4/2/07	6:35 am	13.4	-	90.0
4/18/07	6:20 am	13.0	-	90.0
4/25/07	3:05 pm	12.8	-	90.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
30	2:00*	R-1 25.5 - 30.0	54	100	83	Gray, fine to coarse grained GNEISS, strong, slightly weathered 25.5-27.0', unweathered 27.0-30.0', close to moderate fracture spacing; no apparent foliation; trace mica; orange discoloration between 25.5' and 27.4'; vari-colored and black staining in fractures at 26.0', 26.2', 26.8', 26.95', and 27.3'	II/I	R4	30	3	1.0	25.7
	2:00*								60	3	1.0	26
	2:00*								30	1.5	1.0	26.2
	2:00*								50	1.5	1.0	26.8
	2:00*								40	1.5	2.0	26.81
	2:00*	R-2 30.0 - 35.0	60	100	72	Same as R-1, unweathered; no apparent foliation except faintly at 50° between 30.0' and 31.6'; trace mica; light brown stain and silt deposit < 1/16" in fractures at 31.4', 32.0', and 32.3'; hard brown deposit < 1/16" in fracture at 33.65'; brown silt deposit < 1/16" in fracture at 34.1'	I	R4	50	1.5	1.0	26.95
	2:00*								40	1.5	1.0	27.3
	2:00*								40	1.5	2.0	27.6
	2:00*								30	1.5	1.0	29.6
	2:00*								25	1.5	2.0	31.4
35	2:00*								50	1.5	2.0	32
	2:00*	R-3 35.0 - 40.0	60	100	80	Gray, fine to coarse grained GNEISS, very strong, unweathered, very close to moderate fracture spacing; no apparent foliation except gneissic banding; trace quartz pockets < 0.5"; brown silt deposit < 1/16" in fractures at 31.4', 32.0', and 32.3'; hard brown deposit < 1/16" in fracture at 33.65'; brown silt deposit < 1/16" in fracture at 34.1'	I	R5	45	1.5	1.0	32.15
	2:00*								45	1.5	2.0	32.3
	2:00*								30	1.5	1.0	32.65
	2:00*								55	1.5	2.0	33.65
	2:00*								50	1.5	2.0	34.1
	2:00*	R-4 40.0 - 45.0	59	98	62	Same as R-3, very close to close fracture spacing; no apparent foliation; 0.5" quartz pocket at 41.5' and 2" lens at 44.1'; brown silt deposit < 1/16" in fractures at 40.4', 40.6', 41.3', 42.6', 42.95, 43.1', and 43.2'; joint walls slightly weathered in fractures at 41.7' and 43.8'	I	R5	5	1.5	1.0	34.5
	2:00*								20	1.5	2.0	35.95
	2:00*								20	3	2.0	36.1
	2:00*								40	1.5	2.0	36.95
	2:00*								0	1.5	2.0	37.95
40	2:00*	R-5 45.0 - 50.0	60	100	52	Same as R-3, very close to close fracture spacing; no apparent foliation; trace mica; trace quartz pockets < 0.5"; intersecting healed fractures at 50° between 45.0' and 45.8'; five nearly vertical fractures between 45.8' and 46.4'; green sand deposit < 1/16" in fracture at 48.5'	I	R5	30	1.5	2.0	38.24
	2:00*								20	1.5	1.0	38.25
	2:00*								30	1.5	1.0	39.45
	2:00*								50	1.5	2.0	40.4
	2:00*								50	1.5	2.0	40.6
	2:00*								40	3	1.0	41.1
	2:00*								5	3	2.0	41.3
	2:00*								20	1.5	2.0	41.7
	2:00*								50	1.5	2.0	42.6
	2:00*								50	3	2.0	42.95
45	2:00*								35	1.5	2.0	43.1
	2:00*								60	1.5	2.0	43.2
	2:00*								60	3	2.0	43.8
	2:00*								55	3	1.0	44.45
	2:00*								80	1.5	1.0	45.9
	2:00*								80	1.5	1.0	46.5
	2:00*								70	1.5	2.0	46.8
	2:00*								40	3	2.0	47.35
	2:00*								60	1.5	2.0	47.5
	2:00*											
50	2:00*											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Manchester 2**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **M. Wrightson/C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
55	2:00*	R-6 50.0 - 55.0	60	100	60	Same as R-3, close to moderate fracture spacing; no apparent foliation except gneissic banding; trace mica; healed fractures throughout at 5-40°; joint walls slightly weathered in fractures at 54.2' and 54.75'	I	R5	70	1.5	2.0	47.6
	2:00*								70	3	1.0	48.1
	2:00*								60	1.5	2.0	48.5
	2:00*								10	1.5	1.0	49.35
	2:00*								10	1.5	1.0	49.55
	2:00*	R-7 55.0 - 60.0	60	100	75	Same as R-3, unweathered 55.0-58.8' and 59.4-60.0', slightly weathered 58.8-59.4', close fracture spacing; no apparent foliation; trace mica; trace medium to coarse grained garnet; 1" quartz pockets at 55.6', 57.7', and 58.4'; green gray clay infill < 0.5" in fracture at 55.8'; brown silt deposit < 1/16" in fracture at 56.3'; hard green gray mineral deposit in fracture at 56.9'	I/II	R5	50	1.5	1.0	50.2
	2:00*								75	1.5	1.0	50.4
	2:00*								40	1.5	1.0	50.6
	2:00*								70	1.5	1.0	50.9
	2:00*								30	1.5	1.0	51
60	2:00*	R-8 60.0 - 65.0	60	100	95	Same as R-3, close fracture spacing; no apparent foliation; trace mica; trace medium grained garnet; 1" quartz pocket at 61.0'; nearly vertical healed fracture between 63.6' and 64.3'; brown silt deposit < 1/16" in fracture at 62.05'; brown and red stain in fracture at 62.9'	I	R5	50	3	1.0	51.8
	2:00*								40	1.5	1.0	52.5
	2:00*								40	1.5	1.0	52.95
	2:00*								60	1.5	1.0	53.1
	2:00*								65	1.5	1.0	53.6
	1:26	R-9 65.0 - 70.0	60	100	90	Same as R-3, close fracture spacing; no apparent foliation; trace mica; trace medium grained garnet; 0.25" pocket of mica at 69.4'; gray green silt deposit < 1/16" in fractures at 66.9', 66.95', 67.25', and 69.0'; gray sand deposit in fracture at 67.7'	I	R5	70	3	1.0	53.8
	1:20								50	1.5	2.0	54.2
	1:42								40	3	1.0	54.4
	1:49								50	3	2.0	54.75
	1:21								60	1.0	6.0	55.8
65	1:47	R-10 70.0 - 75.0	60	100	100	Same as R-3, no apparent foliation; trace mica; trace medium grained garnet; 60° healed fracture at 74.2'; gray silt deposit < 1/16" in fracture at 74.5'	I	R5	90	3	2.0	56.3
	1:46								60	1.5	2.0	56.55
	1:51								35	3	2.0	56.9
	2:01								30	3	1.0	57.1
	2:02								70	3	1.0	57.85
70	2:08	R-11 75.0 - 80.0	60	100	88	Same as R-3, no apparent foliation except gneissic banding at 50° between 77.8' and 78.5'	I	R5	0	3	2.0	58.8
	1:46								50	3	2.0	59.5
	1:59								30	1.5	1.0	61
	1:49								40	3	2.0	62.05
	1:53								65	1.5	1.0	62.9
75	2:00*	R-12 80.0 - 85.0	59	98	90	Same as R-3, close to moderate fracture spacing; no apparent foliation; trace mica; trace medium grained garnet; gray silt deposit < 1/16" in fracture at 81.45'	I	R5	50	1.5	1.0	63.05
	2:00*								50	3	1.0	63.7
	1:54								10	1.5	1.0	64.3
	1:57								20	1.5	1.0	64.7
	2:00								50	1.5	1.0	65.45
80	2:03								45	1.5	1.0	65.9
	1:47								30	1.5	2.0	66.9
	1:56								40	1.5	2.0	66.95
	1:46								30	1.5	2.0	67.25
	1:57								10	1.5	2.0	67.7
85	1:57								30	1.5	1.0	67.95
									10	1.5	2.0	69
									10	1.5	1.0	69.25
									50	1.5	0.75	69.4
									50	1.5	0.75	69.45
									30	1.5	1.0	69.6
									0	3	1.0	74
									35	3	2.0	74.5
									70	1.5	1.0	76.7
									75	3	1.0	78.25
									70	1.5	1.0	78.3
									50	3	1.0	78.55
									10	1.5	1.0	79.3
									40	1.5	1.0	80.8
									55	1.5	1.0	81
									45	1.5	2.0	81.45
									40	3	1.0	82.9
									55	1.5	1.0	83.15

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/13/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Manchester 2**
SHEET NUMBER: 5 of 5
PROJECT NUMBER: **18005 A**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **M. Wrightson/C. Nicholson**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
90	2:00	R-13 85.0 - 90.0	59	98	97	Same as R-3, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet	I	R5	50	1.5	0.75	83.5
	1:52											
	2:02											
	1:49								50	1.5	1.0	88.55
	1:47								40	1.5	1.0	89.33
	*approximate					Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded. Well installed with 10' screen 74.7'-84.7' and sealed with bentonite chips upon completion. See separate appendix for well installation log.						
95												
100												
105												
110												
115												
120												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/13/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Manchester 3**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **P. Shipley/M. Wrightson/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Piney Branch Road at
Greenwood Avenue**

COORD. N: **485,020.5** E: **1,311,776.1**






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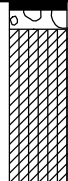








SURFACE ELEV.: **282.8 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/15/07** TIME: **9:30 am**

FINISH DATE: **3/21/07** TIME: **11:00 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	3/21/07	9:30 am	18.0	35.5	95.0
Length		24"				5'					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5			S	1		0.8 - 2.8	14	5	4	7	18	0	0-0.25' Asphalt Pavement
			S	2		2.8 - 4.8	4	2	2	3	18	0.25	0.25-0.75' Gravel (GP) (Pavement subbase)
			S	3		4.8 - 6.8	4	3	3	4	18	0.75	Damp, stiff, brown, Silty CLAY, some fine Sand (CL-ML)
			S	4		6.8 - 8.8	7	8	10	11	18	282.05	Same as S-1, medium stiff (CL-ML)
			S	5		8.8 - 10.8	9	10	17	22	18	4.75	Damp, medium stiff, brown, SILT, some Sand, trace mica (ML)
			S	6		13.5 - 15.0	7	7	8		18	278.05	Same as S-3, very stiff (ML)
			S	7		18.5 - 20.0	15	18	27		18		Same as S-3, hard, yellowish orange (ML)
			S	8		23.5 - 25.0	14	18	32		18		Same as S-3, hard, yellowish orange (ML)



Parsons
Brinckerhoff
Quade &
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BORING LOG

(continued)

BORING NUMBER: **Manchester 3**

SHEET NUMBER: 2 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **P. Shipley/M.
Wrightson/C. Nicholson**

W. H. HARRISON / C. F. HARRISON														
DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.		
30			S	9	■	28.5 - 28.8	50/3"					3	28.5 254.3	Damp, very dense, light brown, fine to coarse SAND, some Silt, trace mica (SM)
35			S	10	■	33.5 - 33.6	50/1"					1	35.5 247.3	Same as S-9 Auger refusal and coring begun at 35.5'.
40														
45														
50														
55														



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

BORING NUMBER: **Manchester 3**

SHEET NUMBER: **3** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **P. Shipley/M. Wrightson/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Piney Branch Road at Greenwood Avenue**

COORD. N: **485,020.5** E: **1,311,776.1**

STN. NO.: OFFSET:

SURFACE ELEV.: **282.8 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/15/07** TIME: **9:30 am**

FINISH DATE: **3/21/07** TIME: **11:00 am**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:				Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE: 2"				3/21/07	9:30 am	18.0	35.5	95.0
O.D.: 3"								
I.D.: 2"								
CASING SIZE: " (")								

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
40	5min/4.5ft*	R-1 35.5 - 40.0	42	78	43	Gray, fine to coarse grained GNEISS, strong, slightly weathered, close fracture spacing; very faint foliation at 50°; orange discoloration 35.5-38'; brown clayey sand deposit in fractures at 36.45', 36.8', 36.9', 37.2', and 38.1'	II	R4	45	1.5	1.0	35.8
									40	1.5	2.0	36.45
									50	1.5	2.0	36.8
									25	1.5	2.0	36.9
									55	1.5	2.0	37.2
									40	1.5	2.0	38.1
									5	3	1.0	38.4
	12min/5ft*	R-2 40.0 - 45.0	60	100	80	Same as R-1, medium strong; very faint foliation at 50°; trace mica; coarse grained garnet throughout; orange discoloration 40.0-44.2'; healed fractures of 30° at 42.25', 42.35', and 42.6'; orange brown clayey sand deposit at 41.4', 42.2', 42.8', and 43.85'	II	R3	0	3	1.0	40.5
									0	3	1.0	41
									20	1.5	2.0	41.4
45	10min/7ft*	R-3 45.0 - 50.0	60	100	90	Same as R-1, unweathered, close to moderate fracture spacing; very faint foliation at 50° and gneissic banding throughout; trace mica; trace medium to coarse grained garnet; lens of mica at 46.9'	I	R4	30	1.5	2.0	42.2
									20	3	1.0	42.7
									40	1.5	2.0	42.8
									0	3	1.0	43.5
									55	1.5	1.0	43.65
									40	1.5	2.0	43.85
									25	1.5	1.0	44.1
									50	1.5	1.0	47.35
									40	1.5	1.0	47.9
									10	1.5	1.0	48.5
50	7min/5ft*	R-4 50.0 - 55.0	59	98	83	Same as R-1, unweathered, very close to moderate fracture spacing; very faint foliation at 50° between 50.0' and 53.5' and no apparent foliation between 53.5' and 55.0'; trace mica; coarse grained garnet throughout	I	R4	50	1.5	1.0	50.7
									50	1.5	1.0	50.9
									10	1.5	1.0	52.4
									20	1.5	1.0	52.45
									50	1.5	2.0	54.1
	9min/5ft*	R-5 55.0 - 60.0	60	100	90	Same as R-1, very strong, unweathered, close to moderate fracture spacing; no apparent foliation; coarse grained (< 0.25" diameter) garnet throughout with pocket of garnets at 57.2'; orange brown clayey sand deposit in fractures at 55.5', 55.6', and 58.5'	I	R5	55	1.5	2.0	55.5
									60	1.5	2.0	55.6
									50	1.5	1.0	56.4
									0	3	1.0	57.05
									20	1.5	1.0	57.15
60									45	1.5	2.0	58.5
									0	1.5	1.0	59.2



Parsons
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Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Manchester 3**
SHEET NUMBER: **4** of **5**
PROJECT NUMBER: **18005 A**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **P. Shipley/M. Wrightson/C. Nicholson**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
65	10min/5ft*	R-6 60.0 - 65.0	60	100	62	Same as R-1, very strong, unweathered 60.0-61.1' and 61.5-65.0', slightly weathered 61.1-61.5', very close to moderate fracture spacing; faint foliation of 50° between 60.0-60.6' and gneissic banding throughout; trace mica; coarse grained garnet throughout; orange brown clayey sand deposit in fractures at 61.15', 61.25', 61.35', 61.45', 62.3', 62.6', 62.9', 64.0', and 64.5'	I/II	R5	60	1.5	1.0	60.1
									20	1.5	1.0	60.6
									25	1.5	1.0	60.85
									30	1.5	1.0	61
									60	1.5	2.0	61.15
									0	3	2.0	61.25
70	10min/5ft*	R-7 65.0 - 70.0	60	100	93		I	R5	15	3	2.0	61.35
									20	1.5	2.0	61.45
									30	1.5	2.0	62.3
									40	1.5	2.0	62.6
									50	3	2.0	62.9
									30	1.5	2.0	64
75	10min/5ft*	R-8 70.0 - 75.0	60	100	97	Same as R-7; no apparent foliation; trace mica; coarse grained garnet throughout	I	R5	20	1.5	2.0	64.5
									40	1.5	2.0	66.9
									55	1.5	2.0	68.3
									45	1.5	2.0	72.2
80	10min/5ft*	R-9 75.0 - 80.0	59	98	98	Same as R-7; no apparent foliation; trace mica; coarse grained garnet throughout	I	R5	30	1.5	1.0	74.8
									70	1.5	2.0	77.5
									15	1.5	1.0	79.4
85	10min/5ft*	R-10 80.0 - 85.0	60	100	100	Same as R-7; no apparent foliation; trace mica; coarse grained garnet throughout	I	R5				
90	17min/5ft*	R-11 85.0 - 90.0	53	88	78	Same as R-7, unweathered 85.0-88.4' and 88.8-89.4', slightly weathered 88.4-88.8', close to moderate fracture spacing; no apparent foliation except gneissic banding throughout; coarse grained garnet throughout	I/II	R5	50	1.5	1.0	86.8
									45	3	1.0	88.35
									35	1.5	1.0	88.7
									45	1.5	1.0	88.75
									40	3	1.0	90.2
									50	1.5	2.0	90.7
95	17min/5ft*	R-12 90.0 - 95.0	60	100	93	Same as R-7, close to wide fracture spacing; no apparent foliation; trace coarse grained garnet; 70° healed fracture at 90.35'	I	R5	40	1.5	1.0	92.9
									50	1.5	1.0	93.85

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/13/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Manchester 3**
SHEET NUMBER: 5 of 5
PROJECT NUMBER: **18005 A**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **P. Shipley/M. Wrightson/C. Nicholson**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
100	2:15	R-13 95.0 - 100.0	60	100	77	Same as R-7, close to moderate fracture spacing; no apparent foliation; trace coarse grained garnet; 45° healed fracture at 95.5'; green staining in fractures at 98.0' and 98.8'; green sand deposit < 1/16" and slightly weathered joint walls in fracture at 98.3'; gray mineral deposits < 0.25" diameter in high angle fracture 99.2-100.0'	I	R5				
	2:38											
	2:47											
	2:42								30	1.5	1.0	98
	2:10								70	1.5	2.0	98.3
105						Bottom of boring at 100'. Coring down pressure 400 psi and 400 rpm 35.5-95.0'. Coring down pressure and rotations per minute not recorded 95.0-100.0'. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.			60	1.5	1.0	98.8
									90	1.5	2.0	99.6
110												
115												
120												
125												
130												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/13/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Manchester 4**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Grass between sidewalk and Piney Branch Road**

COORD. N: **485,087.1** E: **1,312,366.9**

STN. NO.: OFFSET:

SURFACE ELEV.: **256.7 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/21/07** TIME: **12:45 pm**

FINISH DATE: **3/22/07** TIME: **1:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	3/22/07	9:30 am	27.0	35.5	35.5
Length		24"				5'					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
Depth Elev.													
5			S	1		0.0 - 2.0	2	2	3	5	22	0-0.33' Topsoil	
			S	2		2.0 - 4.0	3	7	8	8	12	S-1A (Top 20 inches): Damp, loose, light brown, fine to medium SAND and Clayey Silt (SM)	
			S	3		4.0 - 6.0	4	8	14	20	24	S-1B (Bottom 2 inches): Dry, loose, gray, angular GRAVEL, some Sand (GP)	
			S	4		6.0 - 6.9	8	50/5"			6	S-2A (Top 11 inches): Damp, medium dense, brown, fine to medium SAND, some Silt, trace mica (SM)	
			S	5		8.0 - 9.8	8	39	47	50/3"	21	S-2B (Bottom 1 inch): Damp, medium dense, brown, fine to coarse SAND and angular Gravel (SP)	
													Damp, medium dense, orangish brown, fine to medium SAND, little Silt, trace mica; relict rock structure (SM)
													Dry, very dense, light brown, fine to coarse SAND, some Silt, trace mica; relict rock structure (SM)
													Same as S-4; relict rock structure (SM)
10													
15													
20													



Parsons
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BORING LOG

(continued)

BORING NUMBER: **Manchester 4**

SHEET NUMBER: 2 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
30			S	9		28.5 - 28.6	50/1.5"				0.5		Same as S-4; relict rock structure (SM)
35			S	10		33.5 - 33.6	50/1.25				0		No recovery
												35.5 221.2	Augered to 35.5' to prevent protrusion in street. Rock coring begun at 35.5'.
40													
45													
50													
55													



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

BORING NUMBER: **Manchester 4**
SHEET NUMBER: 3 of 5
PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**
DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Grass between sidewalk and Piney Branch Road**
COORD. N: **485,087.1** E: **1,312,366.9**
STN. NO.: OFFSET:
SURFACE ELEV.: **256.7 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **3/21/07** TIME: **12:45 pm**
FINISH DATE: **3/22/07** TIME: **1:00 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"			3/22/07	9:30 am	27.0	35.5	35.5
O.D.:	3"							
I.D.:	2"							
CASING SIZE:	" (")							

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
40	1:17	R-1 35.5 - 40.1	53	96	87	Gray, fine to coarse grained GNEISS, weak, slightly weathered, close fracture spacing; no apparent foliation except swirly bedding between 38.9' and 40.1'; trace mica; trace coarse grained garnet; hard green mineral deposit in fractures at 35.6', 37.0', and 37.4'; green clay deposit < 1/16" in fracture at 36.15'; gray sandy clay deposit < 1/16" in fractures at 37.5' and 38.05'; 0.5" quartz pocket in fracture at 38.05'	II	R2	5	3	2.0	35.6
	1:12								5	1.5	3.0	36.15
	1:25								60	1.5	2.0	37
	1:12								0	1.5	2.0	37.4
	n/r*								0	3	3.0	37.5
45	1:24	R-2 40.1 - 45.1	59	98	97	Gray, fine to coarse grained GNEISS, medium strong, unweathered, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pocket at 42.4', 1.5" lens at 42.9', and 1" pocket at 44.2'; 60° healed fracture at 41.6'; hard gray mineral deposit thick in fractures at 40.45' and 41.9'; soft gray clay deposit < 1/16" and slightly weathered joint walls in fracture at 44.9'	I	R3	40	1.5	3.0	38.05
	1:32								0	1.5	2.0	40.45
	1:37								30	1.5	2.0	41.9
	1:08											
	1:10								30	1.5	4.0	44.9
50	1:19	R-3 45.1 - 50.1	60	100	100	Gray, fine to coarse grained GNEISS, medium strong, unweathered, wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; 0.25-0.5" quartz pockets throughout at approximate 6" spacing; healed fractures of 40° between 45.1' and 45.45'; gray clay deposit < 1/16" and slightly weathered joint walls in fracture at 45.25'; hard gray mineral deposit in fracture at 47.85'; soft gray clay deposit in fracture at 48.8'	I	R3	40	1.5	3.0	45.25
	1:27								0	1.5	1.0	47.85
	1:43								40	1.5	4.0	48.8
	2:00											
	n/r											
55	1:23	R-4 50.1 - 55.1	60	100	95	Same as R-3; trace coarse grained garnet; quartz pockets < 0.5" between 50.1' and 52.1', 1.5" at 54.2', and 1.5" thick vein at 52.0'; hard green mineral deposit in fracture at 52.25'; gray clay deposit < 1/16" in fracture at 54.45'; gray sand deposit < 1/16" in fracture at 54.8'	I	R3	55	1.5	2.0	52.25
	1:24											
	1:25											
	1:16								40	1.5	3.0	54.45
	1:51								20	1.5	2.0	54.8
60	2:09	R-5 55.1 - 60.1	60	100	100	Same as R-3; trace mica; coarse grained garnet throughout; healed fracture at 57.1'	I	R3				
	2:07											
	2:13								5	1.5	1.0	58.1
	2:21											



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CORING LOG

(continued)

BORING NUMBER: **Manchester 4**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
65	1:37	R-6 60.1 - 65.1	60	100	97	Same as R-3, close fracture spacing 60.1-62.3' and 63.05-64.65', very close fracture spacing 62.3-63.05' and 64.65-65.1'; no apparent foliation; coarse grained garnet throughout; 1" quartz pocket at 61.5'; healed fractures between 40-70° and primarily 50°; gray sandy clay deposit < 0.25" in fracture at 62.3'; green staining and gray clay deposit < 1/16" in fracture at 62.9'; gray clay deposit < 1/16" and slightly weathered joint walls in fracture at 63.05'; gray clay deposit < 1/16" in fracture at 64.65'	I	R3				
	1:40											
	1:22								50	1.5	3.0	62.3
	1:45								40	1.5	3.0	62.9
									70	1.5	3.0	63.05
	1:42											
70	n/r	R-7 65.1 - 70.1	60	100	80	Same as R-3, close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; healed fractures between 68.0' and 68.5' including 30° at 68.05' and nearly vertical at 68.5'; brown staining in fracture and fine fissiles parallel to fracture at 65.3'; brown staining in fractures at 65.5' and 65.6'; gray clay deposit < 0.0625" in fracture at 68.05'; green and white mineral deposits and slightly weathered joint walls in fracture at 69.75'	I	R3	30	1.5	3.0	64.65
									80	1.5	2.0	65.3
	1:37								0	1.5	1.0	65.5
	2:02								90	1.5	1.0	65.6
	2:33								30	1.5	1.0	65.75
	1:42								85	1.5	2.0	68.05
75	2:25	R-8 70.1 - 75.1	60	100	100	Same as R-3, strong; no apparent foliation; coarse grained garnet throughout; 0.5" quartz pockets throughout and 0.5" thick layer at 73.55'	I	R4	50	1.5	1.0	68.2
	2:32								70	1.5	1.0	68.5
	2:56								0	3	2.0	69.75
	2:54											
	2:46											
	n/r											
80	2:52	R-9 75.1 - 80.1	60	100	100	Same as R-3, very strong; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pockets 75.1-80.1' and 1.5-2" lenses at 76.4', 76.9', and 79.8'	I	R5				
	2:50											
	2:56											
	3:02											
	2:35											
	2:02											
85	2:40	R-10 80.1 - 85.1	60	100	100	Same as R-3, very strong; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pockets throughout; hard gray minearl deposit < 1/16" in fracture at 84.5'	I	R5				
	2:27											
	2:03											
	5:22/2'											
	3:01											
	1:43											
90	2:16	R-11 85.1 - 90.1	60	100	100	Same as R-3, very strong; no apparent foliation; trace mica; coarse grained garnet throughout; 2" quartz pockets at 86.8', 87.25', and 87.85'	I	R5	55	1.5	2.0	84.5
95	* not recorded					Bottom of boring at 90.1'. Coring down pressure 500 psi and 500 rpm 35.5-40.1', 450 psi and 450 rpm 40.1-60.1', 600 psi and 500 rpm 60.1-80.1', and 700 psi and 500 rpm from 80.1' to bottom of hole. Hole dry at 2:30PM 3/21/2007 when augering was completed and the casing was at the hole depth of 35.5'. Water depth at 27' nineteen hours later and						



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CORING LOG

(continued)

BORING NUMBER: **Manchester 4**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
100						before coring commenced. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Site restored with seed and straw.						
105												
110												
115												
120												
125												
130												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Piney 2**

SHEET NUMBER: **1** of **3**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Creek Parkway and Piney Branch Road**

COORD. N: **484,078.2** E: **1,310,750.8**






STN. NO.: OFFSET:



SURFACE ELEV.: **204.5 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/9/07** TIME: **12:30 pm**

FINISH DATE: **4/10/07** TIME: **1:30 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		2"				3"					
Hammer Wt.		24"				5'					
Hammer Fall		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
5			S	1	0.0 - 2.0	3	3	5	8	16	0	0-0.083' Topsoil	
			S	2	2.0 - 4.0	8	11	10	10	14	204.42	Damp, loose, brown, fine SAND, some clayey Silt, trace Gravel, trace roots (SM)	
			S	3	4.0 - 6.0	5	4	7	3	12		Damp, medium dense, brown and white, fine to coarse SAND, little Silt, trace mica (SM)	
			S	4	6.0 - 8.0	24	13	6	23	18		Same as S-2, brown (SM)	
			S	5	8.0 - 8.8	30	50/3"			8		Same as S-2, brown, little fine to medium Gravel (SM)	
10											9.7	Dry, very dense, light brown, fine to coarse SAND, some Silt, trace fine Gravel, trace mica (SM)	
											194.8	Auger chatter at 8.5'.	
												Auger refusal and coring begun at 9.7'.	
15													



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Douglas, Inc.

CORING LOG

BORING NUMBER: **Piney 2**

SHEET NUMBER: 2 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Creek Parkway and Piney Branch Road**

COORD. N: **484,078.2** E: **1,310,750.8**

STN. NO.: OFFSET:

SURFACE ELEV.: **204.5 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/9/07** TIME: **12:30 pm**

FINISH DATE: **4/10/07** TIME: **1:30 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
10	n/r*	R-1 9.7 - 14.7	39	65	30	Gray, fine to coarse grained GNEISS, medium strong, slightly weathered, close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; orange discoloration 10.0-10.4', one inch on either side of fractures at 11.6' and 12.25', and 12.4-12.8'; black mineral deposits in fractures at 10.65', 11.1', 11.35', 12.25', 12.5', 12.55', and 12.7'	II	R3	5	1.5	2.0	10
	n/r								20	3	2.0	10.4
	n/r								0	3	1.0	10.6
	1:52								80	3	2.0	10.65
	1:46								30	1.5	2.0	11.1
15	1:45	R-2 14.7 - 19.7	60	100	100	Gray, fine to coarse grained GNEISS, medium strong, unweathered, moderate fracture spacing; no apparent foliation except faint swirly bedding 14.7-18.0'; trace mica; coarse grained garnet throughout; 1" quartz pocket at 17.5' and 0.25" layer at 18.2'; orange discoloration one half inch on either side of fractures at 15.1', 16.5', and 18.2'; orange staining and brown silt deposit < 1/16" in fracture at 16.5'	I	R3	50	1.5	2.0	11.35
	1:47								10	1.5	1.0	11.6
	1:57								60	1.5	2.0	12.25
	2:02								5	1.5	2.0	12.5
	2:00								5	1.5	2.0	12.55
20	1:55	R-3 19.7 - 24.7	60	100	87	Same as R-2; no apparent foliation; coarse grained garnet throughout; 0.5" quartz pockets throughout; orange stain and silt deposit < 1/16" in fracture at 21.0'	I	R3	20	3	2.0	12.7
	1:51								40	1.5	2.0	15.1
	2:03								30	1.5	1.0	15.75
	2:02								25	1.5	2.0	16.5
	2:11								10	1.5	1.0	16.85
25	2:16	R-4 24.7 - 29.7	60	100	97	Same as R-2; no apparent foliation; trace coarse grained garnet; orange staining in fractures at 27.75' and 27.9'	I	R3	40	1.5	0.75	18.2
	2:07								45	1.5	2.0	21
	2:09								70	1.5	2.0	21.3
	2:02								65	1.5	1.0	23.6
	2:02								0	1.5	2.0	26.5
30	1:55	R-5 29.7 - 34.7	60	100	92	Same as R-2, strong, close fracture spacing; no apparent foliation except faint swirly bedding 33.0-34.7'; trace coarse grained garnet; orange staining in fractures at 30.0' and 30.85'	I	R4	5	1.5	1.0	27.75
	1:57								10	1.5	1.0	27.9
	2:03								85	1.5	1.0	28.3
	2:02								15	1.5	1.0	30
	2:04								50	1.5	1.0	30.85
									30	1.5	1.0	32.4
									55	3	1.0	33.4
									65	1.5	1.0	33.9

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
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Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Piney 2**

SHEET NUMBER: 3 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
35	2:01	R-6 34.7 - 39.7	58	97	97	Same as R-2, strong, close fracture spacing; no apparent foliation except faint swirly bedding 38.8-39.5'; trace coarse grained garnet; 0.5" quartz pockets throughout; green stain in fracture at 35.1'; 75° healed fracture between 36.5' and 38.0'; green mineral deposit in fracture at 38.0'	I	R4	0	3	1.0	34.1
	2:00								10	1.5	1.0	35.1
	2:02								85	1.5	1.0	35.7
	2:22								10	1.5	2.0	38
	2:11								40	1.5	1.0	38.85
40	2:16	R-7 39.7 - 44.7	60	100	87	Same as R-2, strong, very close to close fracture spacing; no apparent foliation; trace mica; green gray clayey sand deposit < 1/16" in all fractures between 41.6' and 43.5'	I	R4				
	2:02								10	1.5	3.0	41.6
	4:33/2								50	1.5	3.0	41.8
									5	1.5	3.0	42.1
	1:46								20	1.5	3.0	43.3
45	2:05	R-8 44.7 - 49.7	58	97	97	Same as R-2, very strong, wide fracture spacing; no apparent foliation; 0.5" quartz pockets throughout	I	R5	50	1.5	3.0	43.5
	2:17								50	1.5	1.0	45.3
	1:42								10	1.5	1.0	47.25
	1:59								10	1.5	1.0	48.05
	1:42								85	1.5	1.0	48.9
50	* not recorded					Bottom of boring at 49.7'. Coring down pressure 200 psi and 300 rpm 9.7-14.7', 400 psi and 400 rpm 14.7-19.7', and 500 psi and 500 rpm from 19.7' to bottom of hole. Hole dry to 9.7' when water introduced for coring. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring. Sealed with bentonite chips upon completion. Boring drilled in grass median on Sligo Creek Parkway. Site restored with seed and straw.						
55												
60												
65												



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BORING LOG

BORING NUMBER: **Plymouth 1**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Plymouth Street**

COORD. N: **486,020.2** E: **1,310,372.2**

STN. NO.: OFFSET:

SURFACE ELEV.: **306.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/2/07** TIME: **10:00 am**

FINISH DATE: **4/3/07** TIME: **2:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■ 1.375"	U □	P □	G □	C □	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		2"				3"					
Length		24"				6'					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.		
													0	0-0.7' Asphalt Pavement
5			S	1		0.7 - 2.7	5	7	7	8	18	306.1	Dry, medium dense, brown, fine SAND, little Silt, trace Gravel, trace mica (SM)	
			S	2		2.7 - 4.7	5	4	8	8	18	305.4	Damp, medium dense, brown, fine to medium SAND, some clayey Silt (SM)	
			S	3		4.7 - 6.7	5	5	6	8	18		Same as S-2, trace fine Gravel; faint relict rock structure (SM)	
			S	4		6.7 - 8.7	8	9	15	15	20		Same as S-2, trace fine Gravel; faint relict rock structure (SM)	
10			S	5		8.7 - 10.7	5	9	9	12	20		Damp, medium dense, brown, fine to coarse SAND, some Silt, trace mica (SM)	
15			S	6		13.5 - 15.0	15	26	30		18		Same as S-5, white; faint relict rock structure in bottom 12 inches (SM)	
			S	7		18.5 - 20.0	9	11	19		18		Same as S-5, mottled white and brown; relict rock structure (SM)	
20			S	8		23.5 - 25.0	39	50/6"			12		Same as S-5, very dense, gray brown, trace black friable angular fine Gravel; relict rock structure	



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BORING LOG

(continued)

BORING NUMBER: **Plymouth 1**
SHEET NUMBER: 2 of 5
PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
													(SM)
30			S	9		28.5 - 28.9	50/5"				5		Damp, very dense, gray and brown, fine to coarse SAND, some Silt, little fine Gravel, trace mica (SM)
35			S	10		33.5 - 33.7	50/2"				2		Same as S-9 (SM)
40			S	11		38.5 - 38.9	50/5"				5		Same as S-9 (SM)
45			S	12		43.5 - 43.5	50/0.5"				0		No recovery
												45.6 260.5	Augered to 45.6' to prevent protrusion in street. Rock coring begun at 45.6'.
50													
55													



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Quade &
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CORING LOG

BORING NUMBER: **Plymouth 1**

SHEET NUMBER: 3 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Plymouth Street**

COORD. N: **486,020.2** E: **1,310,372.2**

STN. NO.: OFFSET:

SURFACE ELEV.: **306.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/2/07** TIME: **10:00 am**

FINISH DATE: **4/3/07** TIME: **2:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
50	1:51	R-1 45.6 - 50.0	53	100	72	Gray, fine to coarse grained GNEISS, medium strong, slightly weathered 45.6-47.4' and 47.7-50.0', moderately weathered 47.4-47.7', close fracture spacing; no apparent foliation; trace mica including 1" pocket at 46.4'; coarse grained garnet throughout; coarse grained green mineral throughout; orange staining in fractures at 45.8', 47.35', and 47.4-47.7'; gray clayey sand deposit < 1/16" in fracture at 48.3'; gray sand deposit < 1/16" in fracture at 49.15'	II/III	R3	55	1.5	1.0	45.8
	1:21								40	1.5	1.0	46.1
	1:13								40	3	1.0	46.2
	1:16								50	3	1.0	47.2
	1:15								60	3	1.0	47.35
55	1:13	R-2 50.0 - 55.0	60	100	73	Same as R-1, medium strong 50.0-54.0', weak 54.0-55.0', unweathered 50.0-54.0', moderately weathered 54.0-55.0', close fracture spacing 50.0-54.0', very close fracture spacing 54.0-55.0'; no apparent foliation; trace mica; coarse grained garnet throughout; coarse grained green mineral throughout; orange discoloration 54.0-55.0'; healed fractures throughout at 40'; gray mineral deposit in fractures at 51.1', 51.6', and 52.05'; gray brown silty sand infill 0.25" thick, fissiles, and quartz pieces in fracture at 52.9'; vari colored staining in fracture at 54.15'; light brown silty sand deposit < 1/16" in fracture at 54.35'; vari colored, friable rock between 54.35' and 54.7'	I/III	R3/R2	50	1.5	1.0	47.65
	1:01								55	1.5	3.0	48.3
	1:04								0	3	2.0	49.15
	1:06								60	1.5	1.0	50.95
	1:16								50	1.5	2.0	51.1
60	1:17	R-3 55.0 - 60.0	60	100	62	Same as R-1, unweathered, very close to close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; coarse grained green mineral throughout; 0.25-0.5" quartz pockets between 55.0' and 55.2'; healed fracture of 50° at 55.8' and 70° at 58.4'; gray sand deposit < 1/16" in fractures at 56.4' and 56.6'; orange brown staining in and discoloration 0.25" around fractures between 57.9' and 58.15'; orange brown staining, silty sand deposit < 1/16", and slightly weathered joint walls in fracture at 59.4'	I	R3	40	3	2.0	51.6
	1:18								20	1.5	2.0	52.05
	1:24								40	1.0	4.0	52.9
	1:20								0	1.5	1.0	53.8
	1:26								35	1.5	1.0	54.15
65	1:43	R-4 60.0 - 65.0	60	100	83	Same as R-1, unweathered, very close to close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; coarse grained green mineral throughout; 0.25-0.5" quartz pockets between 55.0' and 55.2'; healed fracture of 50° at 55.8' and 70° at 58.4'; gray sand deposit < 1/16" in fractures at 56.4' and 56.6'; orange brown staining in and discoloration 0.25" around fractures between 57.9' and 58.15'; orange brown staining, silty sand deposit < 1/16", and slightly weathered joint walls in fracture at 59.4'	I	R4	40	3	2.0	54.35
	1:26								0	3	2.0	54.7
	1:28								0	1.5	1.0	54.85
	1:32								50	3	1.0	56.2
	1:20								90	3	1.0	56.3
70	1:12	R-5 65.0 - 70.0	58	97	83	R-4: Gray, fine to coarse grained GNEISS, strong, unweathered, close fracture spacing; no apparent foliation except gneissic banding between 63.3' and 64.5'; coarse grained garnet throughout; trace coarse grained green mineral; hard gray mineral deposit in fractures at 61.05' and 62.15'	I	R4	50	1.5	2.0	56.6
									50	1.5	2.0	56.85
									10	1.5	1.0	57.25
									30	1.5	2.0	57.45
									65	1.5	1.0	57.75



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CORING LOG

(continued)

BORING NUMBER: **Plymouth 1**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA				
									ANGLE (deg)	Jr	Ja	DEPTH (feet)	
75	1:23	R-6 70.0 - 75.0	60	100	67	R-5: Same as R-4; no apparent foliation; trace mica; coarse grained garnet throughout; trace coarse grained green mineral; quartz lens at 66.65'; gray clay deposit < 1/16" in fracture at 67.1'; green gray clayey sand deposit < 1/16" in fracture at 68.0'; quartz pocket and green gray clay deposit < 1/16" in fracture at 68.8'	I	R4	40	1.5	1.0	66.55	
	50								1.5	3.0	67.1		
	75								3	3.0	68		
	40								1.5	1.0	68.35		
	60								3	3.0	68.8		
80	1:25	R-7 75.0 - 80.0	60	100	85	R-6: Same as R-4, very close to close fracture spacing; no apparent foliation; trace mica; medium grained garnet throughout; trace coarse grained green mineral; quartz lens 74.2-74.5'; healed fracture of 60° at 70.65' with green gray clay infill; dark gray clayey sand deposit < 0.25" in fracture at 71.9'; light green silty clay deposit < 1/16" in fractures at 72.7' and 73.3'	I	R4	70	1.5	1.0	70.15	
	5								1.5	1.0	71.1		
	5								1.5	1.0	71.3		
	50								1.0	4.0	71.9		
	10								1.5	1.0	72.5		
85	1:17	R-8 80.0 - 85.0	58	97	75	R-7: Same as R-4; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; healed fractures at 75.5', 75.65', and 5-60° between 76.6-77.6'	I	R4	10	1.5	3.0	72.7	
	60								1.5	2.0	73		
	25								1.5	3.0	73.3		
	30								1.5	1.0	73.5		
	15								1.5	2.0	73.9		
90	1:15	R-9 85.0 - 90.0	60	100	92	Same as R-4; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; trace coarse grained green mineral; quartz pockets throughout; healed fractures throughout including 10° to nearly vertical between 82.1' and 85.0'; gray clayey sand deposit 0.25" thick in fractures between 81.2' and 82.1'	I	R4	20	1.5	2.0	74.1	
	30								3	2.0	74.5		
	35								1.5	1.0	75.9		
	55								1.5	2.0	76.5		
	65								3	2.0	76.85		
95	1:45	R-10 90.0 - 95.0	60	100	95	Same as R-4; moderate fracture spacing; no apparent foliation except faint swirly bedding between 91.4' and 95.0'; nearly vertical high angle healed fractures from 90.0' to 90.7' and 92.5' to 93.9'	I	R4	60	3	2.0	76.95	
	60								3	2.0	77.4		
	60								3	2.0	77.6		
	20								3	1.0	80.4		
	0								1.0	6.0	81.2		
100	3:27/2ft	R-11 95.0 - 100.0	60	100	100	Same as R-4, wide fracture spacing; no apparent foliation except faint swirly bedding between 95.0' and 96.2'; trace mica; coarse grained garnet throughout	I	R4	30	1.0	6.0	81.35	
	30								1.0	6.0	81.5		
	20								1.0	6.0	81.75		
	50								1.0	6.0	82.1		
	10								3	1.0	82.85		
105	1:45								40	1.5	1.0	83.6	
	10								3	1.0	83.65		
	10								1.5	2.0	83.75		
	30								1.5	1.0	84.3		
	55								1.5	1.0	84.65		
	2:51								75	3	1.0	84.8	
	20								1.5	1.0	85.9		
	0								1.5	1.0	87		
	50								1.5	1.0	87.9		
	10								3	1.0	88.3		
	2:03								20	3	1.0	88.5	
	50								1.5	2.0	88.6		
	50								1.5	1.0	89.5		
	0								1.5	1.0	89.65		
	5								1.5	1.0	92		
	1:41								30	1.5	1.0	93.55	
	50								1.5	2.0	93.9		
	50								1.5	1.0	97.4		
	10								1.5	1.0	98		
	10								1.5	1.0	99.6		
	1:52					Bottom of boring at 100'. Coring down pressure 450 psi and 400 rpm 45.6-60.0'. Coring pressure and rotations per minute not recorded 60.0-100.0'. No accurate groundwater level readings possible due to use of water while rock coring. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion.							



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CORING LOG

(continued)

BORING NUMBER: **Plymouth 1**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
110						Pavement restored with asphalt patch.						
115												
120												
125												
130												
135												
140												

PURPLE LINE CORING LOG - PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



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BORING LOG

BORING NUMBER: **Plymouth 2**
SHEET NUMBER: 1 of 4
PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **M. Wrightson/C. Nicholson**
DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**
LOCATION: **Reading Road near Plymouth Street**
COORD. N: **486,047.0** E: **1,310,919.9**
STN. NO.: OFFSET:
SURFACE ELEV.: **317.1 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **3/29/07** TIME: **9:00 am**
FINISH DATE: **3/30/07** TIME: **12:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■ 1.375"	U □	P □	G □	C □	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		2"					3/29/07	1:20 pm	32.2	45.5	45.5
Length		24"					4/9/07	6:20 am	20.0	-	100.0
Hammer Wt.		140lbs	Drill Rod Size				4/18/07	6:15 am	19.8	-	100.0
Hammer Fall		30"	I.D. (O.D.)				4/25/07	3:00 pm	19.6	-	100.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
5 													

BORING LOG

(continued)

BORING NUMBER: **Plymouth 2**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Silver Spring, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: E. Hill

INSPECTOR: **M. Wrightson/C.
Nicholson**

[illegible]



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Quade &
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CORING LOG

BORING NUMBER: **Plymouth 2**

SHEET NUMBER: 3 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **M. Wrightson/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Reading Road near Plymouth Street**

COORD. N: **486,047.0** E: **1,310,919.9**

STN. NO.: OFFSET:

SURFACE ELEV.: **317.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/29/07** TIME: **9:00 am**

FINISH DATE: **3/30/07** TIME: **12:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
3/29/07	1:20 pm	32.2	45.5	45.5
4/9/07	6:20 am	20.0	-	100.0
4/18/07	6:15 am	19.8	-	100.0
4/25/07	3:00 pm	19.6	-	100.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
50	0:36/0.5ft	R-1 45.5 - 50.0	53	98	65	Gray, fine to medium grained GNEISS, weak, moderately weathered, extremely close to close fracture spacing; core recovery is highly fractured such that fractures depths and infills are not certain; no apparent foliation	III	R2				
	1:16											
	1:31											
	1:30											
55	1:03	R-2 50.0 - 55.0	38	63	30	Gray, fine to coarse grained GNEISS, very weak, extremely to moderately weathered, very close fracture spacing; core recovery is highly fractured such that fractures depths and infills are not certain; no apparent foliation	III/IV	R1				
	1:11											
	0:46											
	1:28											
60	1:44	R-3 55.0 - 60.0	60	100	17	Gray, fine to coarse grained GNEISS, weak, moderately to slightly weathered, very close to close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout	II	R2	70	3	2.0	55.7
	1:12								20	3	2.0	55.8
	0:52								10	3	2.0	56.1
	0:55								0	1.5	2.0	56.4
65	1:01	R-4 60.0 - 65.0	59	98	83	Gray, fine to coarse grained GNEISS, medium strong, slightly weathered, close fracture spacing; no apparent foliation except faint swirly bedding 60.0-61.7'; trace mica; coarse grained (< 0.25" diameter) garnet throughout; orange discoloration 61.5-61.9' and 62.3-64.7'	II	R3	0	1.5	2.0	56.6
	1:05								30	1.5	2.0	56.8
	1:15								40	3	2.0	57.15
	1:24								0	3	2.0	57.3
70	1:11	R-5 65.0 - 70.0	60	100	63	Same as R-4, extremely close fracture spacing; no apparent foliation; high angle healed fractures throughout; brown staining and light brown mineral deposits in all fractures between 65.5' and 69.6'	II	R3	30	3	2.0	57.5
	1:19								0	3	2.0	57.8
	0:59								85	3	1.0	58
	1:06								10	3	2.0	58.1



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CORING LOG

(continued)

BORING NUMBER: **Plymouth 2**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **M. Wrightson/C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA				
									ANGLE (deg)	Jr	Ja	DEPTH (feet)	
75	1:49	R-6 70.0 - 75.0	60	100	28	Same as R-4, weak, very close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; trace coarse grained green mineral; 1" quartz lens at 72.8' and 1" thick quartz vein at 73.65'	II	R2	50	1.5	2.0	66.1	
	1:43								70	1.5	2.0	66.3	
	1:51								70	1.5	2.0	66.5	
	1:54								80	1.5	2.0	66.6	
	1:17								70	1.5	2.0	66.7	
	80	1:07	R-7 75.0 - 80.0	60	100	90	Same as R-4, close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; coarse grained green mineral throughout; 1" quartz pockets throughout and 4" quartz lens between 75.6' and 75.9'; healed fractures at 60° throughout	II	R3	85	1.5	2.0	67.5
		1:13								0	1.5	2.0	67.9
		1:00								80	3	2.0	68.3
		1:06								65	1.5	2.0	69.6
		0:58								85	1.5	1.0	70.15
85		0:55	R-8 80.0 - 85.0	60	100	88	Same as R-4, unweathered, close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; coarse grained green mineral throughout; high angle healed fractures throughout	I	R3	30	1.5	1.0	70.4
		0:56								30	1.5	1.0	70.6
		1:00								30	1.5	1.0	70.7
		1:00								5	1.5	1.0	70.9
		0:59								5	1.5	1.0	71.1
	90	1:22	R-9 85.0 - 90.0	60	100	98	Gray, fine to coarse grained GNEISS, strong, unweathered, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; trace coarse grained green mineral; 0.5" quartz pockets at moderate spacing; slightly weathered joint walls in fracture at 87.0'	I	R4	30	1.5	1.0	71.2
		1:29								5	1.5	1.0	71.39
		1:36								90	3	1.0	71.41
		1:28								5	3	2.0	73.6
		1:25								0	1.5	2.0	76.1
95		1:22	R-10 90.0 - 95.0	58	97	97	Bit replaced at top of run after fracturing 90.0-90.16'. Same as R-9, wide joint spacing; no apparent foliation; trace mica; coarse grained garnet throughout; trace coarse grained green mineral; 3" quartz pocket at 90.2' and 2" quartz pockets at 92.0', 92.8', 93.6'	I	R4	0	1.5	1.0	76.3
		1:54								0	1.5	1.0	76.4
		1:49								60	1.5	2.0	78.55
		1:28								0	1.5	2.0	79.8
		1:47								50	1.5	1.0	81.2
	100	1:32	R-11 95.0 - 100.0	59	98	97	Same as R-9; no apparent foliation; trace mica; medium to coarse grained garnet throughout; coarse grained green mineral throughout; quartz lens at 96.8' and 1.5" thick quartz veins at 97.1' and 98.5'	I	R4	55	1.5	1.0	81.75
		1:35								60	1.5	1.0	82
		1:51								70	1.5	1.0	82.3
		1:31								0	1.5	2.0	82.85
		1:27								5	1.5	1.0	83.4
105										80	1.5	1.0	83.7
										5	3	2.0	87
										0	1.5	2.0	89.1
										35	3		89.9



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BORING LOG

BORING NUMBER: **Plymouth 3**

SHEET NUMBER: 1 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Arliss Street near Flower Avenue**

COORD. N: **485,877.4** E: **1,311,287.1**






STN. NO.: OFFSET:


















SURFACE ELEV.: **308.2 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/3/07** TIME: **2:00 pm**

FINISH DATE: **4/9/07** TIME: **11:30 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	4/4/07	10:15 am	24.0	25.0	25.0
Length		24"				5'	4/5/07	9:00 am	12.0	40.5	75.0
Hammer Wt.		140lbs	Drill Rod Size				4/9/07	9:00 am	21.1	0.0	90.0
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
												Depth Elev.	
												0	0-0.83' Asphalt Pavement
			S	1		1.0 - 3.0	6	7	6	8	20	308.2	S-1A (Top 5 inches): Damp, medium dense, brown, fine to coarse SAND, some Clay, trace Gravel (SC)
			S	2		3.0 - 5.0	10	7	8	9	18	307.8	S-1B (Bottom 15 inches): Damp, stiff, brown, SILT, some fine Sand, trace mica (ML)
5			S	3		5.0 - 7.0	6	5	6	9	22	306.784	Damp, medium dense, brown, fine to medium SAND and Clayey Silt, trace fine Gravel, trace mica (SM)
			S	4		7.0 - 9.0	12	13	17	29	20	305.2	Same as S-2; faint relict rock structure (SM)
			S	5		9.0 - 11.0	7	11	15	19	24		Damp, medium dense, brown, fine to medium SAND and Clayey Silt, trace black friable angular Gravel, trace mica; relict rock structure (SM)
10			S	6		13.5 - 15.0	8	4	5		18		Same as S-4; relict rock structure (SM)
15			S	7		18.5 - 20.0	9	18	27		12		Same as S-4, hard (SM)
20			S	8		23.5 - 25.0	7	12	16		12		Same as S-4, white, orange, and brown (SM)



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BORING LOG

(continued)

BORING NUMBER: **Plymouth 3**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										



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CORING LOG

BORING NUMBER: **Plymouth 3**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Arliss Street near Flower Avenue**

COORD. N: **485,877.4** E: **1,311,287.1**

STN. NO.: OFFSET:

SURFACE ELEV.: **308.2 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/3/07** TIME: **2:00 pm**

FINISH DATE: **4/9/07** TIME: **11:30 am**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
4/4/07	10:15 am	24.0	25.0	25.0
4/5/07	9:00 am	12.0	40.5	75.0
4/9/07	9:00 am	21.1	0.0	90.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	1:24/0.5ft	R-1 40.5 - 45.0	54	100	70	Gray, fine to coarse grained GNEISS, strong, unweathered, extremely close to close fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; gray clay deposit < 1/16" in fracture at 41.0'; hard gray mineral deposit in fracture at 41.1'; gray silty sand deposit < 0.25" in fractures at 42.5' and 43.6'; gray sand deposit in fracture at 44.5'	I	R4	0	1.5	4.0	41
	2:23								5	1.5	2.0	41.1
	1:26								40	1.5	1.0	41.6
	1:39								60	1.0	4.0	42.5
	1:54								50	1.0	4.0	43.6
	1:26	R-2 45.0 - 50.0	60	100	98	Gray, fine to coarse grained GNEISS, medium strong, slightly weathered to unweathered, close to moderate fracture spacing; swirly bedding throughout; trace mica; trace coarse grained garnet; 0.5" quartz pockets throughout; green mineral deposit in fracture at 46.9'; dark gray silty sand deposit < 1/8" in fracture at 47.8'; slightly weathered joint walls in fracture at 49.2'	I	R3	0	3	1.0	44.3
	1:21								75	1.5	2.0	44.5
	1:27								5	1.5	2.0	44.8
	1:19								0	1.5	1.0	46.2
	1:54								40	3	1.0	46.3
50	1:13	R-3 50.0 - 55.0	60	100	90	Same as R-2; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; 0.25" quartz pockets throughout; green sand deposit < 1/8" in fractures at 50.65' and 51.0'; gray fine to coarse sand with little clay 1" thick in fracture at 52.9'	I	R3	0	1.5	2.0	46.9
	1:15								40	3	2.0	47.8
	1:16								50	3	1.0	47.9
	1:22								40	3	2.0	48
	1:20								40	3	2.0	48.7
	1:29	R-4 55.0 - 60.0	60	100	87	Same as R-2, strong; swirly bedding throughout; trace mica; coarse grained garnet throughout; 0.5" quartz pockets throughout and 1" vein at 57.4' and 60°; 80° healed fractures throughout; gray sand deposits < 1/16" in fractures at 57.15', 58.2', and 59.2'	I	R4	60	1.5	2.0	49.2
	1:20								65	1.5	1.0	49.7
	1:44								70	1.5	2.0	50.65
	1:54								70	1.5	2.0	51
	1:38								65	1.5	1.0	51.5
60	1:17	R-5 60.0 - 65.0	60	100	98	Same as R-2, very strong; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; 0.5" quartz pockets throughout and 1" thick vein at 61.1' and 50°	I	R5	45	1.5	1.0	52.35
	1:29								40	1.0	6.0	52.9
	1:38								20	1.5	1.0	53.95
	1:35								30	1.5	1.0	55.5
	1:22								10	1.5	2.0	57.15
65									30	1.5	2.0	58.2
									10	1.5	2.0	59.2
									50	1.5	2.0	61.1
									20	3	1.0	62.5
									10	3	1.0	62.65
									85	3	1.0	63.2
									60	3	1.0	63.8
									50	3	1.0	64.2

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
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CORING LOG

(continued)

BORING NUMBER: **Plymouth 3**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA				
									ANGLE (deg)	Jr	Ja	DEPTH (feet)	
70	1:40	R-6 65.0 - 70.0	60	100	98	Same as R-2, very strong, very close to moderate fracture spacing; faint swirly bedding throughout; coarse grained garnet (< 0.25" diameter) throughout; hard gray mineral deposit in fractures at 65.1' and 69.65'	I	R5	50	1.5	2.0	65.1	
	1:35												
	1:50												
	1:21												
	1:23												
	1:37	R-7 70.0 - 75.0	58	97	97	Same as R-2, very strong; faint swirly bedding throughout; coarse grained garnet throughout; 0.25" quartz pockets throughout	I	R5	70	1.5	1.0	68.7	
	1:34								60	1.5	2.0	69.65	
	1:34								40	1.5	1.0	70.3	
	1:34								70	1.5	1.0	71.2	
	1:16								40	1.5	2.0	71.95	
1:28													
75	n/r*	R-8 75.0 - 80.0	55	92	92	Same as R-2, very strong, close fracture spacing; faint swirly bedding throughout; trace coarse grained garnet; 0.25" quartz pockets throughout; 80° healed fractures throughout	I	R5	70	1.5	1.0	74.5	
	n/r												
	1:54								30	3	1.0	77	
	1:44								65	1.5	1.0	78	
	1:30								60	1.5	1.0	79.3	
80	1:35	R-9 80.0 - 85.0	60	100	80	Same as R-2, very strong; faint swirly bedding throughout; trace coarse grained garnet; hard gray mineral deposit in fracture at 80.9'; green staining in deposit in fracture at 81.7'	I	R5	0	3	1.0	80.4	
	1:35								30	1.5	2.0	80.9	
	1:46								75	1.5	1.0	81.7	
	1:50								60	1.5	1.0	82.5	
	1:25								60	1.5	1.0	83.4	
	1:25	R-10 85.0 - 90.0	60	100	70	Same as R-2, very strong, very close to moderate fracture spacing; faint swirly bedding throughout; trace coarse grained garnet and garnet as large at 0.25" diameter 88.2-88.9'; 65-85° healed fractures throughout	I	R5	85	3	1.0	84	
	1:35								60	3	1.0	84.5	
	1:37								85	3	2.0	85.4	
	1:37								85	3	2.0	86.1	
	1:55								70	3	1.0	87.6	
90	1:53								60	1.5	1.0	88.3	
	* not recorded					Bottom of boring at 90'. Coring down pressure 400 psi and 400 rpm 40.5-75.0' and 500 psi and 400 rpm 75.0-90.0'. After completion of hole and while removing core barrel rods, possible cave in around rods. Fifty feet of core barrel that could not be retrieved abandoned in hole. Cement grouted through core barrel rods from bottom of hole to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.			40	1.5	2.0	88.8	
									30	3	1.0	89.3	
95													
100													



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BORING LOG

BORING NUMBER: **Sligo 1**
SHEET NUMBER: **1** of **5**
PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**
DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**
LOCATION: **West side of Silver Spring Fire Station No. 1**
COORD. N: **482,206.5** E: **1,304,482.2**
STN. NO.: OFFSET:
SURFACE ELEV.: **335.9 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **2/1/07** TIME: **2:45 pm**
FINISH DATE: **2/12/07** TIME: **3:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	2/2/07	8:30 am	26.9	29.5	29.5
Length		24"				5'	2/20/07	6:30 am	26.2	-	90.0
Hammer Wt.		140lbs	Drill Rod Size				2/28/07	6:35 am	26.1	-	90.0
Hammer Fall		30"	I.D. (O.D.)				3/5/07	6:25 am	26.0	-	90.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS			
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)	
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)			RQD %	
												Depth Elev.		
5			S	1	0.0 - 2.0	10	10	10	14	16	0	335.9	Dry, medium dense, black, medium to coarse SAND, some Gravel (SP) (FILL)	
			S	2	2.0 - 4.0	17	7	6	5	10		3.5	S-2A (Top 6 inches): Same as S-1 (SP) (FILL)	
			S	3	4.0 - 6.0	3	3	4	7	18		332.4	S-2B (Bottom 4 inches): Dry, medium dense, brown, medium to coarse SAND, trace low plasticity Silt, trace mica (SP-SM) (FILL)	
			S	4	6.0 - 8.0	12	14	6	5	14		6	329.9	Same as S-2B (SP-SM) (FILL)
			S	5	8.0 - 10.0	3	3	3	4	24		7	328.9	S-4A (Top 4 inches): Dry, medium dense, gray, GRAVEL (GP) (Concrete fragments) (FILL)
10			S	6	13.5 - 15.0	5	3	4		16		8	327.9	S-4B (Bottom 10 inches): Damp, stiff, brown, Silty CLAY, trace fine Sand, trace mica (CL-ML)
														Damp, medium stiff, brown, CLAY, some fine Sand, trace mica (CL)
15														Pocket penetrometer: 2.0tsf, pocket torvane: 2.5tsf
			S	7	18.5 - 20.0	6	8	10		18		13.5	322.4	Damp, loose, orangish brown, fine to medium SAND, little Silt, trace mica; faint relict rock structure (SM)
20			S	8	23.5 - 25.0	7	8	11		16				Damp, medium dense, brown, fine SAND, some Silt, trace mica; faint relict rock structure (SM)



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CORING LOG

BORING NUMBER: **Sligo 1**

SHEET NUMBER: 3 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **West side of Silver Spring
Fire Station No. 1**

COORD. N: **482,206.5** E: **1,304,482.2**

STN. NO.: OFFSET:

DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**

SURFACE ELEV.: **335.9 feet**

DATUM: **NAD 83/91 and NAVD 88**

DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

START DATE: **2/1/07** TIME: **2:45 pm**

FINISH DATE: **2/12/07** TIME: **3:00 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"			2/2/07	8:30 am	26.9	29.5	29.5
O.D.:	3"			2/20/07	6:30 am	26.2	-	90.0
I.D.:	2"			2/28/07	6:35 am	26.1	-	90.0
CASING SIZE:	" (")			3/5/07	6:25 am	26.0	-	90.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
30	1:40	R-1 29.5 - 30.0	6	100	0	Gray, medium grained GNEISS, very strong, slightly weathered, very close to close fracture spacing; no apparent foliation; brown staining in fracture at 29.83'	II I	R5 R5	0	1.5	1.0	29.83
	1:45								0	3	1.0	30.2
	1:50	R-2 30.0 - 35.0	60	100	97				5	1.5	1.0	32.5
35	1:55					Gray, medium grained GNEISS, very strong, unweathered, close to wide fracture spacing; no apparent foliation; trace mica; quartz pockets throughout; reddish brown staining in fracture at 30.2'	I	R5	10	1.5	1.0	33.95
	1:40								20	1.5	2.0	36.15
	1:45	R-3 35.0 - 40.0	60	100	98				20	1.5	2.0	37.75
40	1:49					Same as R-2, moderate to wide fracture spacing; swirly bedding throughout; 0.25-0.5" quartz pockets at approximate 6" spacing; green mineral deposit in fractures at 36.15' and 37.75'	I	R5	20	1.5	1.0	39.9
	1:56								20	1.5	2.0	41.65
	2:00	R-4 40.0 - 45.0	60	100	100				30	1.5	2.0	43.5
45	1:32					Same as R-2, wide fracture spacing; no apparent foliation	I	R5	0	1.5	1.0	44.5
	1:43											
	1:49											
50	1:42	R-5 45.0 - 50.0	60	100	100	Same as R-2, moderate to wide fracture spacing; no apparent foliation; 0.5" quartz pockets throughout	I	R5	50	1.5	1.0	51.65
	1:28											
	1:38											
	1:48											
	1:46											
	1:28	R-6 50.0 - 55.0	60	100	100							
	1:37											
	1:40											
	1:42											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
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CORING LOG

(continued)

BORING NUMBER: **Sligo 1**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
55	1:35	R-7 55.0 - 60.0	60	100	97	Same as R-2; no apparent foliation; quartz lens at 57.35' and pocket at 57.95'	I	R5	20	1.5	1.0	54.75
	2:12											
	2:04											
	2:06											
	1:58											
60	1:46	R-8 60.0 - 65.0	60	100	100	Same as R-2, moderate to wide fracture spacing; no apparent foliation; trace mica; 0.5" quartz pockets throughout and 1" quartz lens at 62.1'	I	R5	50 60	1.5 1.5	3.0 3.0	59.05 59.3
	2:00											
	2:08											
	2:01											
	2:15											
65	1:55	R-9 65.0 - 70.0	60	100	100	Same as R-2, wide fracture spacing; no apparent foliation; 0.5" quartz pockets throughout	I	R5	0	1.5	1.0	64.3
	2:00											
	n/r*											
	1:55											
	2:00											
70	2:05	R-10 70.0 - 75.0	60	100	100	Same as R-2, wide fracture spacing; no apparent foliation; trace coarse grained garnet; 0.5" quartz pockets throughout	I	R5				
	2:08											
	2:00											
	2:04											
	2:06											
75	2:05	R-11 75.0 - 80.0	60	100	100	Same as R-2; no apparent foliation; 0.5" quartz pocket at 76.95'; brown mineral deposit in fracture at 76.95'	I	R5	50 60	3 1.5	1.0 2.0	75.15 76.95
	2:20											
	2:10											
	n/r											
	2:43											
80	2:02	R-12 80.0 - 85.0	60	100	100	Same as R-2, moderate to wide fracture spacing; no apparent foliation; quartz pockets and lenses throughout	I	R5	5 50 50	1.5 1.5 1.5	1.0 1.0 1.0	79.5 82.05 82.8
	2:04											
	1:57											
	2:03											
	2:14											
85	2:03	R-13 85.0 - 90.0	60	100	100	Same as R-2, wide fracture spacing; swirly bedding throughout; trace mica	I	R5				
	2:23											
	1:46											
	2:00											
	2:01											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
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CORING LOG

(continued)

BORING NUMBER: **Sligo 1**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
90	2:02 * not recorded					Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded. Drilling progress delayed several days due to inclement weather. Well installed with 10' screen 77'-87' and sealed with bentonite chips upon completion. See separate appendix for well installation log.			10	1.5	1.0	89.5
95												
100												
105												
110												
115												
120												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Sligo 2**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Avenue west of Fenton Street**

COORD. N: **482,034.6** E: **1,305,356.5**






STN. NO.: OFFSET:

SURFACE ELEV.: **350.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **1/31/07** TIME: **10:00 am**

FINISH DATE: **2/1/07** TIME: **12:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	2/1/07	8:30 am	5.2	40.5	49.5
Length		24"				5'					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
5 <													



Parsons
Brinckerhoff
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Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **Sligo 2**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
													(SM)
30			S	9		28.5 - 28.9	50/5"				5		Same as S-8 (SM)
35			S	10		33.5 - 33.7	50/2"				2	33.5 316.9	Damp, very dense, dark gray and brown, medium SAND, trace Silt, trace mica (SP-SM)
40			S	11		38.5 - 38.6	50/<1"				0.5		Same as S-10 (SP-SM)
45												40.9 309.5	Augered to 40.9' to prevent protrusion in street. Rock coring begun at 40.9'.
50													
55													



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CORING LOG

BORING NUMBER: **Sligo 2**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **Sligo Avenue west of Fenton Street**

COORD. N: **482,034.6** E: **1,305,356.5**

STN. NO.: OFFSET:

DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**

SURFACE ELEV.: **350.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

START DATE: **1/31/07** TIME: **10:00 am**

FINISH DATE: **2/1/07** TIME: **12:00 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"			2/1/07	8:30 am	5.2	40.5	49.5
O.D.:	3"							
I.D.:	2"							
CASING SIZE:	" (")							

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	1:50	R-1 40.9 - 44.6	44	100	94	Gray, medium grained GNEISS, medium strong, slightly weathered, very close fracture spacing; faint swirly bedding throughout; green mineral deposit in fracture at 42.83'	II	R3				
	1:40								10	1	2.0	42.83
	1:35								20	1.5	2.0	43.16
	1:40	R-2 44.6 - 49.6	60	100	65	Same as R-1, very close to close fracture spacing; faint swirly bedding throughout; medium grained garnet throughout; 0°, 20°, and nearly vertical healed fractures throughout; green sand deposit < 1/16" in fractures at 47.48', 48.23', 48.53', 48.73', and 49.13'; slightly weathered joint walls in fracture at 47.78'	II	R3	20	3	2.0	44.8
	1:33											
	1:15								25	1.5	1.0	46.6
	1:43								25	1.5	2.0	47.48
50	1:44								40	3	2.0	47.78
	1:30	R-3 49.6 - 54.6	60	100	70	Same as R-1, strong, unweathered, very close to close fracture spacing; faint swirly bedding throughout; trace mica; medium grained garnet throughout; 0.25-0.5" quartz pockets throughout; green mineral deposit in fractures at 50.43', 50.58', 50.78', 53.23' and 54.23'; moderately weathered joint walls in fracture at 52.33'	I	R4	50	1.5	2.0	48.23
	1:20								0	3	2.0	48.53
	n/r*								20	3	2.0	48.73
	n/r								30	3	2.0	49.13
	1:15								30	3	2.0	50.43
55	1:25								40	3	2.0	50.58
	1:19								10	3	2.0	50.78
	1:15								40	1.5	2.0	52.33
	1:28	R-4 54.6 - 59.6	58	97	97	Same as R-1, strong, unweathered, close to wide fracture spacing; faint swirly bedding throughout; trace mica; medium grained garnet throughout; 0° to nearly vertical healed fractures; brown mineral deposit and moderately weathered joint walls in fracture at 55.33'; brown staining in fractures at 56.68', 57.38', and 59.43'	I	R4	40	1.5	2.0	53.23
	1:10								0	1.5	2.0	54.23
60	1:25								40	1.0	2.0	55.33
	1:30								30	1.5	2.0	56.68
	1:15	R-5 59.6 - 64.6	60	100	97	Same as R-1, very strong, unweathered, close to moderate fracture spacing; swirly bedding throughout; trace medium grained garnet; brown mineral deposit in fractures at 61.68', 62.68', 64.03', and 64.33'	I	R5	50	1.5	2.0	57.38
	1:20											
	1:13								0	1.5	2.0	59.43
65	2:04								10	1.5	2.0	61.68
									10	1.5	2.0	62.68
									5	1.5	2.0	64.03
									10	1.5	2.0	64.33
									60	1.5	2.0	64.7

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Sligo 2**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

PURPLE LINE CORING LOG - PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
70	1:41	R-6 64.6 - 69.6	60	100	85	two 3/8" quartz veins at 0.5" spacing at 64.65'; brown mineral deposit in fractures at 64.93' and 65.43'; green mineral deposit in fractures at 68.33', 68.4', 68.53', and 68.63'	I	R5	0	1.5	2.0	64.93
	1:31								0	1.5	2.0	65.43
	1:56								10	1.5	2.0	68.33
	1:24								0	3	2.0	68.4
	1:47								0	1.5	2.0	68.53
75	1:33	R-7 69.6 - 74.6	60	100	78	Same as R-1, very strong, unweathered, extremely close to moderate fracture spacing; swirly bedding throughout; trace medium grained garnet; 1/2" quartz pocket at 73.0'; green staining in fractures at 70.08', 71.63', 71.93', and 72.38'; brown sand deposit < 1/16" in fracture at 73.33'	I	R5	10	1.5	2.0	68.63
	1:26								20	1.5	2.0	69.1
	1:29								10	1.5	1.0	70.08
	1:38								10	1.5	1.0	71.63
	1:10								0	1.5	1.0	71.93
80	1:21	R-8 74.6 - 79.6	60	100	95	Same as R-1, very strong, unweathered, close fracture spacing; swirly bedding throughout; trace mica; medium grained garnet throughout; 20" healed fractures throughout; brown mineral deposit < 1/16" in fractures at 76.98', 77.78', 78.38', and 78.48'; green staining in fracture at 77.18'; clayey sand infill < 0.25" in fracture at 77.28'	I	R5	20	3	1.0	72.38
	1:12								90	1.5	2.0	72.5
	1:23								20	1.5	2.0	73
	1:14								20	3	2.0	73.33
	1:43								20	1.5	2.0	73.9
85	1:23	R-9 79.6 - 84.6	60	100	87	Same as R-1, very strong, unweathered, fine to medium grained, close fracture spacing; swirly bedding throughout; trace mica; medium grained garnet throughout; medium grained green mineral throughout; brown mineral deposit in fracture at 80.58'; green staining in fractures at 81.48' and 82.23'; green sand deposit < 1/16" in fracture at 81.68' and 81.88'	I	R5	20	1.5	2.0	74.4
	1:32								15	1.5	2.0	76.98
	1:27								70	1.5	1.0	77.18
	1:36								70	1.0	5.0	77.28
	1:54								20	3	2.0	77.78
90	1:32	R-10 84.6 - 89.6	60	100	96	Same as R-1, very strong, unweathered, close to moderate fracture spacing; no apparent foliation; trace mica; medium grained garnet throughout; medium grained green mineral throughout; brown mineral deposit in fractures at 86.73', 88.23', and 89.33'	I	R5	40	1.5	2.0	78.38
	1:28								70	1.5	2.0	78.48
	1:42								0	1.5	2.0	80.58
	1:08								10	1.5	1.0	81.48
	* not recorded								10	1.5	2.0	81.68
95						Bottom of boring at 89.6'. Coring down pressure and rotations per minute not recorded. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement surface restored with asphalt patch.			70	1.5	2.0	81.88
									20	3	1.0	82.23
									5	1.5	2.0	83.25
									10	1.5	2.0	83.75
									20	1.5	2.0	85.6
100									20	3	2.0	86.73
									40	1.5	2.0	88.23
									20	1.5	2.0	89.33



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Sligo 3**
SHEET NUMBER: 1 of 4
PROJECT NUMBER: **18005 A**
LOCATION: **801 Sligo Avenue**
COORD. N: **482,035.5** E: **1,306,029.9**
STN. NO.: OFFSET:
SURFACE ELEV.: **348.1 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **1/29/07** TIME: **9:40 am**
FINISH DATE: **1/30/07** TIME: **3:00 pm**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**
DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		2"				3"					
Hammer Wt.		24"				5'					
Hammer Fall		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
			S	1		0.0 - 1.5	2	1	2		12	0 348.1 347.94	0-0.16' Topsoil Moist, soft, brown, SILT and CLAY, trace Gravel (CL-ML)
5			S	2		3.5 - 5.0	7	9	9		14		Moist, very stiff, brown, Silty CLAY, some fine Sand (CL-ML) Pocket penetrometer slightly penetrated sample at max 4.5tsf, pocket torvane could not penetrate sample
10			S	3		8.5 - 10.0	4	6	9		18	10 338.1	Moist, very stiff, white, CLAY and SILT, trace fine Sand (CL-ML) Pocket penetrometer 4.5tsf, pocket torvane could not penetrate sample
15			S	4		13.5 - 15.0	2	3	4		18		Moist, medium stiff, mottled white and brown, Clayey SILT, some fine to medium Sand, trace mica (ML) Pocket penetrometer not used, pocket torvane: 1.25tsf
20			S	5		18.5 - 20.0	4	9	16		18	19.25 328.85	S-5A (Top 9 inches): Same as S-4 (ML) S-5B(Bottom 9 inches): Damp, medium dense, reddish brown, fine to medium SAND and Silt, trace mica (SM)
			S	6		23.5 - 25.0	4	7	10		18		Damp, medium dense, gray, fine to medium SAND, some Silt, trace mica; faint relict rock structure (SM)



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **Sligo 3**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

BORING NUMBER: **Sligo 3**
SHEET NUMBER: 3 of 4
PROJECT NUMBER: **18005 A**
LOCATION: **801 Sligo Avenue**
COORD. N: **482,035.5** E: **1,306,029.9**
STN. NO.: OFFSET:
SURFACE ELEV.: **348.1 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **1/29/07** TIME: **9:40 am**
FINISH DATE: **1/30/07** TIME: **3:00 pm**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**
DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

CORE BARREL DATA:	NOTES:	GROUNDWATER DATA				
		Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
TYPE: NX						
CORE SIZE: 2"						
O.D.: 3"						
I.D.: 2"						
CASING SIZE: " (")						

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
60	3:30	R1 55.0 - 60.0	60	100	90	Gray, fine to medium grained GNEISS, weak, unweathered, very close to moderate fracture spacing; no apparent foliation; green staining and mineral deposit and slightly weathered joint walls in all fractures between 55.7' and 59.05'	I	R2				
	2:40								30	1.5	2.0	55.7
	3:10								30	3	2.0	56.5
	3:00								30	1.5	2.0	56.85
	2:45								30	1.5	2.0	57.25
									30	1.5	2.0	57.7
65	1:30	R2 60.0 - 65.0	57	95	90	Same as R-1, medium strong; very thin bedding at 20° 60.0-61.0' and swirly bedding 61.0-65.0'; green staining and mineral deposit and slightly weathered joint walls in fracture at 60.75'; 0.5" quartz pocket inside fracture at 62.5'	I	R3				
	1:30								20	1.5	2.0	60.75
	1:35								10	1.5	2.0	62
	1:40								20	1.5	2.0	62.5
	1:20								20	1.5	2.0	63.5
	1:40								10	1.5	2.0	64.05
70	1:40	R3 65.0 - 70.0	46	77	52	Same as R-1, medium strong, swirly bedding throughout; extremely fractured quartz vein at 70° between 67.0' and 67.6'; green staining in fracture at 66.25'; slightly weathered joint walls in fracture at 67.0'; fracture zone with slightly to moderately weathered discontinuous network of core stones 67.6-69.4'.	III/II	R3				
	1:35								20	1.5	2.0	64.55
	2:30/3								0	1.5	2.0	64.75
									0	1.5	1.0	66.25
									0	1.5	2.0	66.6
									20	1.0	4.0	67
75	1:56	R4 70.0 - 75.0	57	95	73	Same as R-1, medium strong; swirly bedding throughout; green staining in fracture at 71.95'	I	R3				
	2:02								0	1.5	2.0	69.4
	2:06								0	1.5	2.0	70
	1:54								25	1.5	1.0	71.6
	n/r*								0	1.5	1.0	71.95
									10	1.5	2.0	72.1
	1:35	R5 75.0 - 80.0	60	100	100	Same as R-1, fine to coarse grained, strong, moderate to wide fracture spacing; no apparent foliation; green mineral deposit in fractures at 76.7' and 79.3'; brown staining and 3/8" quartz pocket in fracture at 79.75'	I	R4				
	1:35								5	3	2.0	74.45
	1:20								5	3	2.0	74.75
	1:40								30	1.5	2.0	76.7
	1:36								0	3	2.0	79.3

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Sligo 3**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
85	n/r	R6 80.0 - 85.0	60	100	100	Same as R-1, medium to coarse grained, strong, moderate to wide fracture spacing; no apparent foliation; 0.25-0.5" quartz pockets at 1" spacing between 80.0' and 81.25' and 0.5" vein at 84.15' and 15°; slightly weathered joint walls in fracture at 84.5'	I	R4	30	3	1.0	79.75
	n/r											
	n/r											
	n/r											
	n/r											
	1:20	R7 85.0 - 90.0	60	100	87	Same as R-1, strong, extremely close to moderate fracture spacing; no apparent foliation; green staining in fractures at 87.7', 88.65', and 88.8'	I	R4	0	3	2.0	83.25
	1:45								0	1.5	2.0	84.15
	1:38								0	1.5	2.0	84.5
	1:41								0	1.5	2.0	85.25
	1:54											
90	* not recorded					Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Boring drilled in grass area between street and municipal parking lot. Site restored with seed and straw.			60	1.5	1.0	87.7
					30		3	2.0	88.2			
					0		3	1.0	88.65			
					0		3	1.0	88.8			
95												
100												
105												
110												

PURPLE LINE CORING LOG - PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
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BORING LOG

BORING NUMBER: **Sligo 4**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Ave at Ritchie Ave**

COORD. N: **482,082.8** E: **1,307,179.4**

STN. NO.: OFFSET:

SURFACE ELEV.: **329.3 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/21/07** TIME: **9:00 am**

FINISH DATE: **2/22/07** TIME: **3:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	2/28/07	7:50 am	22.6	-	89.5
Length		24"				5'	4/18/07	6:30 am	15.2	-	89.5
Hammer Wt.		140lbs	Drill Rod Size				4/25/07	3:15 pm	15.3	-	89.5
Hammer Fall		30"	I.D. (O.D.)				4/26/07	10:15 am	15.1	-	89.5

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
											Depth Elev.		
5			S	1	0.0 - 2.0	5	4	3	2	10	0.33	0-0.33' Asphalt Pavement	
			S	2	2.0 - 4.0	7	1	1	1	1	328.97	Damp, loose, brown, fine SAND, some clayey Silt, trace mica (SM) (FILL)	
			S	3	4.0 - 6.0	1	woh	woh	woh	12	327.3	Wet, very loose, gray and black, coarse grained GRAVEL (GP) (FILL)	
			S	4	6.0 - 8.0	woh	woh	woh	woh	8	325.3	Damp, very soft, brown, Silty CLAY, trace fine Sand (CL) (FILL) Pocket penetrometer: 0.75tsf, pocket torvane: 2.0tsf Same as S-3, little fine Sand (CL) (FILL)	
10		S	5	8.0 - 10.0	woh	1	2	2	14	321.3	Damp, very loose, brown, fine to coarse SAND, little fine to coarse Gravel, little Silt, trace mica (SM)		
15		S	6	13.5 - 15.0	5	7	10		18			Damp, medium dense, brown, fine SAND, little clayey Silt, trace black friable angular fine Gravel, trace mica; faint relict rock structure (SM)	
20		S	7	18.5 - 20.0	7	11	13		18			Same as S-6; faint relict rock structure (SM)	
		S	8	23.5 - 25.0	11	23	35		18			Same as S-6, very dense; faint relict rock structure (SM)	



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BORING LOG

(continued)

BORING NUMBER: **Sligo 4**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS			
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)				
							CORING								
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.			
30			S	9		28.5 - 29.5	39	50/6"			10	28.5 29.5 30.345	S-9A (Top 1.5 inches): Dry, very dense, gray, fine grained angular GRAVEL (GP)		
35			S	10		33.5 - 33.9	50/5"				5		S-9B (Bottom 4.5 inches): Damp, very dense, brown, fine to coarse SAND, little Silt, trace black friable angular fine Gravel, trace mica; faint relict rock structure (SM)		
40			S	11		38.5 - 38.5	50/<1"				0		Same as S-9B (SM)		
45												40.5 288.8	Augered to 40.5' to prevent protrusion in street. Rock coring commenced at 40.5'.		
50															
55															



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CORING LOG

BORING NUMBER: **Sligo 4**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Ave at Ritchie Ave**

COORD. N: **482,082.8** E: **1,307,179.4**

STN. NO.: OFFSET:

SURFACE ELEV.: **329.3 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/21/07** TIME: **9:00 am**

FINISH DATE: **2/22/07** TIME: **3:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
2/28/07	7:50 am	22.6	-	89.5
4/18/07	6:30 am	15.2	-	89.5
4/25/07	3:15 pm	15.3	-	89.5
4/26/07	10:15 am	15.1	-	89.5

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA						
									ANGLE (deg)	Jr	Ja	DEPTH (feet)			
45	0:57	R-1 40.5 - 44.5	46	96	0	Gray and brown, medium grained GNEISS, very weak to weak, highly weathered, extremely close to close fracture spacing. Core recovery is primarily discontinuous core stones such that fractures depths and infills are not certain. Weathering and discoloration are more pronounced on fractures. Most fractures are discontinuous, highly weathered, colored with orange and brown, and rounded. Same as R-1, weak, slightly to moderately weathered	IV	R2							
	0:56														
	1:00														
	1:02	R-2 44.5 - 49.5	60	100	0		III/II	R2							
	1:16														
1:06															
50	1:05	R-3 49.5 - 54.5	60	100	0	Same as R-1, weak, slightly to moderately weathered	III/II	R2							
	0:58														
	1:05														
	0:46	R-4 54.5 - 59.5	59	98	98		Gray, medium grained GNEISS, medium strong, slightly weathered, close fracture spacing; swirly bedding throughout; trace mica; medium grained garnet throughout; 0.5-1" quartz pockets throughout; green discoloration throughout; green staining and slightly weathered joint walls in fracture at 57.3'; hard green mineral deposit < 1/16" in fracture at 58.2'	II	R3						
	0:58														
0:50															
55	0:57	R-5 59.5 - 64.5	60	100	97	Same as R-4, unweathered, very close to moderate fracture spacing; no apparent foliation; trace mica; medium grained garnet throughout; hard green mineral deposit in fracture at 60.5'		I	R3	10	1.5	1.0	56.55		
	0:52														
	1:15														
	60	1:12	R-6 64.5 - 69.5	60	100		97	Gray, medium grained GNEISS, medium strong, slightly weathered, close fracture spacing; swirly bedding throughout; trace mica; medium grained garnet throughout; 0.5-1" quartz pockets throughout; green discoloration throughout; green staining and slightly weathered joint walls in fracture at 57.3'; hard green mineral deposit < 1/16" in fracture at 58.2'	II	R3	10	1.5	1.0	56.55	
		1:11													
1:08															
65		0:57	R-7 69.5 - 74.5	60	100	97	Same as R-4, unweathered, very close to moderate fracture spacing; no apparent foliation; trace mica; medium grained garnet throughout; hard green mineral deposit in fracture at 60.5'		I	R4	60	1.5	2.0	58.2	
		1:16													
	1:04														



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CORING LOG

(continued)

BORING NUMBER: **Sligo 4**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
70	1:00	R-6 64.5 - 69.5	60	100	97	unweathered, close to moderate fracture spacing; no apparent foliation; 45-80° healed fractures throughout; green staining and slightly weathered joint walls in fractures at 66.95' and 67.1'	I	R4				
	1:01								0	1.5	2.0	66.95
	0:58								0	1.5	2.0	67.1
	0:54											
	2:13*											
75	1:12	R-7 69.5 - 74.5	56	93	85	Same as R-6, very close to close fracture spacing; no apparent foliation; slick fracture surface and slightly weathered joint walls in fracture at 72.0'; sand deposit < 1/16" in fracture at 72.55'	I	R4	25	1.5	1.0	69.55
	1:13								15	1.5	1.0	70.4
	1:13											
	1:27								55	1	2.0	72
									10	1.5	1.0	72.35
80	1:32	R-8 74.5 - 79.5	60	100	81	Same as R-6, very close to moderate fracture spacing; no apparent foliation; green staining in fracture at 76.35'; fine sand deposit < 0.25" in fracture at 76.55'; hard gray deposit < 1/16" in fracture at 77.2'	I	R4	0	1.5	1.0	72.55
	1:10								5	1.5	1.0	72.8
	1:20											
									30	1.5	2.0	74.7
									30	1.0	4.0	76.35
85	1:02	R-9 79.5 - 84.5	60	100	60	Same as R-6, slightly weathered 79.5-79.95' and 80.1-82.5', highly weathered 79.95-80.1', unweathered 82.5-84.5', close fracture spacing; trace mica; medium grained garnet throughout; hard gray mineral deposit in fractures at 80.3', 80.5', and 82.3'; green staining in fracture at 83.4'	IV/II/I	R4	30	1.5	1.0	76.55
	1:42								30	1.5	1.0	76.8
	2:02								75	1.5	2.0	77.2
	1:53								15	1.5	1.0	77.5
	1:49								5	1.5	1.0	79.8
90	1:10	R-10 84.5 - 89.5	60	100	97	Same as R-6; no apparent foliation; trace mica; medium grained garnet throughout; 0.5" quartz pockets at approximate 1' spacing and 2" vein at 85.1'; green staining in all fractures between 85.1' and 88.7'; silty fine sand between 86' and 86.2'	I	R4	20	1.5	1.0	79.95
	1:11								5	1.5	1.0	80.1
	1:23								0	3	2.0	80.3
	1:25								20	3	2.0	80.5
	1:38								45	2	1.0	80.8
95						Bottom of boring at 89.5'. Coring down pressure 400 psi and 450 rpm 40.5-69.5', 300 psi and 450 rpm 69.5--84.5', and 400 psi and 450 rpm 84.5-89.5'. Well installed with 10' screen 77'-87' and sealed with bentonite chips upon completion. See separate appendix for well installation log.			45	1.5	1.0	81.05
		30	1.5	1.0	81.6							
		30	1.5	1.0	81.9							
		45	1.5	1.0	82.2							
		5	1.5	2.0	82.3							
100									5	1.5	1.0	82.5
									5	1.5	1.0	83.4
									5	1.5	1.0	83.6
									5	1.5	2.0	85.1
									40	1.0	6.0	86



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BORING LOG

BORING NUMBER: **Sligo 6**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Ave at Hartford Rd**

COORD. N: **482,428.9** E: **1,309,067.8**






STN. NO.: OFFSET:

SURFACE ELEV.: **307.0 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/19/07** TIME: **9:00 am**

FINISH DATE: **2/20/07** TIME: **11:40 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		2"				3"					
Hammer Wt.		24"				5'					
Hammer Fall		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5			S	1	0.0 - 2.0	8	6	5	4	10	0	0-0.33' Asphalt Pavement	
			S	2	2.0 - 4.0	4	5	5	5	12	306.67	Damp, stiff, brown, Silty CLAY, little fine Sand, trace mica (CL-ML) (FILL)	
			S	3	4.0 - 6.0	6	4	4	6	24	305	Damp, loose, light brown, fine SAND, little clayey Silt, trace mica (SM)	
			S	4	6.0 - 8.0	10	10	8	12	20		Same as S-2, brown (SM)	
			S	5	8.0 - 10.0	8	10	10	11	24		Same as S-2, medium dense, brown (SM)	
15			S	6	13.5 - 14.4	35	50/5"			10	13.5	Same as S-2, very dense; faint relict rock structure (SM)	
			S	7	18.5 - 19.4	22	50/5"			10		Same as S-2, very dense; faint relict rock structure (SM)	
			S	8	23.5 - 24.4	25	50/5"			10		Same as S-2, very dense; faint relict rock structure (SM)	



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BORING LOG

(continued)

BORING NUMBER: **Sligo 6**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
30			S	9		28.5 - 28.8	50/4"				4	Same as S-2, very dense; faint relict rock structure (SM)	
35			S	10		33.5 - 33.8	50/4"				4	Same as S-2, very dense; faint relict rock structure (SM)	
40			S	11		38.5 - 38.5	50/<1"				0.5	38.5 268.5 Dry, very dense, gray, angular GRAVEL (Rock fragments) (GP)	
45												40.5 266.5 Augered to 40.5' to prevent protrusion in street. Rock coring begun at 40.5'.	
50													
55													



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CORING LOG

BORING NUMBER: **Sligo 6**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Sligo Ave at Hartford Rd**

COORD. N: **482,428.9** E: **1,309,067.8**

STN. NO.: OFFSET:

SURFACE ELEV.: **307.0 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/19/07** TIME: **9:00 am**

FINISH DATE: **2/20/07** TIME: **11:40 am**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	7:30/4ft	R-1 40.5 - 44.5	48	100	94	Gray, fine grained GNEISS, strong, unweathered, close fracture spacing; no apparent foliation; green staining and brown mineral deposit in fractures at 40.8' and 43.7'; brown staining in fractures at 41.45', 42.25', and 43.25'; brown clay deposit < 1/16" in fracture at 44.05'	I	R4	0	1.5	1.0	40.65
									50	1.5	2.0	40.8
									45	1.5	1.0	41.45
									5	1.5	1.0	42.25
									55	1.5	1.0	43.25
50	6:00/5ft	R-2 44.5 - 49.5	58	97	70	Gray, fine to medium grained GNEISS, strong, unweathered, extremely close to close fracture spacing; no apparent foliation; green staining in fracture at 45.45'; gray mineral deposit in fracture at 48.05'	I	R4	10	1.5	2.0	43.7
									0	1.0	4.0	44.05
									60	1.5	1.0	44.75
									50	1.5	1.0	44.9
									50	1.5	1.0	45.05
55	8:10/5ft	R-3 49.5 - 54.5	60	100	77	Same as R-2, close to moderate fracture spacing; no apparent foliation; green staining in all fractures between 50.6' and 54.1' in addition to slightly weathered joint walls in fracture at 50.6'	I	R4	80	1.5	1.0	45.45
									0	1.5	1.0	45.7
									10	1.5	1.0	46.2
									10	1.5	1.0	46.3
									30	1.5	2.0	48.05
60	n/r*	R-4 54.5 - 59.5	60	100	85	Same as R-2, close to moderate fracture spacing; no apparent foliation; green staining in all fractures between 55.3' and 57.0' in addition to gray mineral deposit in fracture at 55.3'	I	R4	0	1.5	2.0	50.6
									70	1.5	1.0	50.9
									10	3	1.0	51.2
									70	1.5	1.0	51.4
									20	1.5	1.0	53.3
65	8:40/5ft	R-5 59.5 - 64.5	60	100	65	Same as R-2; no apparent foliation	I	R4	40	1.5	1.0	53.9
									50	1.5	1.0	54.1
									75	1.5	2.0	55.3
									15	1.5	1.0	55.8
									30	1.5	1.0	56.5
	n/r					Same as R-2; no apparent foliation; gray clayey sand	I	R4	30	3	1.0	56.75
									30	3	1.0	57
									0	1.5	3.0	63.2
									0	1.5	3.0	63.7
									30	1.5	3.0	64

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Sligo 6**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
70	n/r	R-6 64.5 - 69.5	60	100	70	< 0.25" in fracture at 69.05'	I	R4	0	1.5	3.0	64.2
									0	1.5	1.0	64.75
									10	1.5	1.0	65.05
									0	1.5	1.0	65.9
									30	1.5	1.0	66.6
									30	1.5	1.0	66.8
									0	1.5	1.0	67
									20	1.5	1.0	67.5
									60	3	1.0	67.8
									10	1.5	1.0	68.4
75	7:00/5ft	R-7 69.5 - 74.5	60	100	88	Same as R-2, very close to close fracture spacing; no apparent foliation; coarse grained garnet throughout; green staining in all fractures between 69.7' and 74.25' in addition to green mineral deposit and slightly weathered joint walls in fracture at 73.4'	I	R4	0	1.5	1.0	68.6
									0	1.5	1.0	68.7
									20	1.0	4.0	69.05
									0	1.5	1.0	69.7
									30	1.5	1.0	70.5
									0	1.5	1.0	72.55
									0	1.5	1.0	72.65
									20	1.5	1.0	72.85
									10	1.5	2.0	73.4
									10	1.5	1.0	73.8
80	n/r	R-8 74.5 - 79.5	60	100	88	Same as R-2, very close to close fracture spacing; no apparent foliation; coarse grained garnet throughout; green mineral deposit in all fractures between 74.9' and 79.35'	I	R4	15	1.5	1.0	74.25
									25	1.5	2.0	74.9
									25	1.5	2.0	75.2
									0	1.5	2.0	75.9
									45	1.5	2.0	76.3
									50	1.5	2.0	76.6
									50	1.5	2.0	76.7
									0	1.5	2.0	77.4
									40	1.5	2.0	78.2
									0	1.5	2.0	79.35
85	n/r	R-9 79.5 - 84.5	56	93	70	Same as R-2, unweathered 79.5-82.65' and 83.0-84.5', extremely weathered 82.65-83.0', very close to close fracture spacing; no apparent foliation; coarse grained garnet throughout; 0.5-1" quartz pockets between 83.45' and 84.25'; red staining and gray mineral deposit in fracture at 81.6'; green staining in fractures at 82.5', 83.45', 83.7', and 84.25'; slick joint walls in fracture at 84.25'	I	R4	30	1.5	1.0	79.65
									30	1.5	1.0	80.1
									30	1.5	1.0	81.6
									30	1.5	1.0	82.5
									35	1.5	1.0	82.65
									35	3	1.0	83.25
									0	1.5	1.0	83.45
									0	1.5	1.0	83.7
									0	1.5	2.0	84.25
									15	1.5	1.0	85.2
90	* not recorded	R-10 84.5 - 89.5	60	100	73	Same as R-2, very close to close fracture spacing; no apparent foliation; coarse grained garnet throughout; 2" quartz pockets throughout and quartz vein 86.5-86.8'; green discoloration throughout	I	R4	20	1.5	1.0	85.4
									20	1.5	2.0	86
									0	1.5	1.0	86.3
									0	1.5	1.0	86.5
									0	1.5	1.0	86.65
									10	1.5	1.0	86.75
									10	1.5	1.0	87.25
									10	1.5	1.0	87.8
									10	1.5	1.0	87.85
									30	1.5	1.0	88.5
95						Bottom of boring at 89.5'. Coring down pressure and rotations per minute not recorded. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.				1.5	1.0	89
100												



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BORING LOG

BORING NUMBER: **Sligo 8**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Southwest corner of Piney Branch Road and Dale Drive**

COORD. N: **483,270.0** E: **1,309,688.6**

STN. NO.: OFFSET:

SURFACE ELEV.: **244.9 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/11/07** TIME: **2:00 pm**

FINISH DATE: **4/17/07** TIME: **11:00 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■ 1.375"	U □	P ▢	G ☒	C ▢	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		2"				3"	4/18/07	9:30 am	22.2	14.7	79.7
Length		24"				5'	4/25/07	3:10 pm	19.1	-	89.7
Hammer Wt.		140lbs	Drill Rod Size				4/26/07	10:10 am	18.3	-	89.7
Hammer Fall		30"	I.D. (O.D.)				5/2/07	3:20 pm	20.5	-	89.7

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
5			S	1		0.0 - 2.0	4	3	3	5	18	0-0.16' Topsoil	
			S	2		2.0 - 4.0	4	11	6	3	10	Moist, loose, brown, medium to coarse SAND, some fine Gravel, little clayey Silt (SM) (FILL)	
			S	3		4.0 - 6.0	2	4	3	3	18	Damp, medium dense, brown, fine to medium SAND, some clayey Silt, trace mica; 1" pocket of red angular fine Gravel at tip of spoon (SM) (FILL)	
			S	4		6.0 - 8.0	4	4	7	12	18	Damp, loose, brown, fine to coarse SAND, some Silt, trace mica (SM)	
			S	5		8.0 - 10.0	11	13	15	17	18	Same as S-3, medium dense; faint relict rock structure (SM)	
10			S	6		13.5 - 13.6	50/1"				1	Damp, medium dense, brown, fine to medium SAND and Silt with 2" pocket of gray angular fine Gravel, trace mica (SM)	
15												Auger chatter 12.0-12.5'	
												13.5	Dry, hard, brown and black, subangular GRAVEL (rock fragments) (GP)
												14.7	Auger refusal and coring begun at 14.7'.
												230.2	
20													



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CORING LOG

BORING NUMBER: **Sligo 8**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Southwest corner of Piney Branch Road and Dale Drive**

COORD. N: **483,270.0** E: **1,309,688.6**

STN. NO.: OFFSET:

SURFACE ELEV.: **244.9 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/11/07** TIME: **2:00 pm**

FINISH DATE: **4/17/07** TIME: **11:00 am**

CORE BARREL DATA:						NOTES:	GROUNDWATER DATA					
							Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)	
TYPE: NX												
CORE SIZE: 2"							4/18/07	9:30 am	22.2	14.7	79.7	
O.D.: 3"							4/25/07	3:10 pm	19.1	-	89.7	
I.D.: 2"							4/26/07	10:10 am	18.3	-	89.7	
CASING SIZE: " (")							5/2/07	3:20 pm	20.5	-	89.7	
DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
15	2:29	R-1 14.7 - 19.7	60	100	58	Gray, fine to coarse grained GNEISS, medium strong, very close fracture spacing; gneissic banding throughout; quartz pockets throughout including 1" at 18.9' and 19.3'; orange discoloration throughout; black soil staining in fracture at 15.25'; moderately weathered joint walls in fracture at 17.3'; brown silty sand deposit < 1/8" in fracture at 18.3' and in fractures at 18.5', 18.7', and 19.25' with additional black staining	II	R3	0	3	1.0	14.9
	20								1.5	1.0	15.25	
	45								3	1.0	15.5	
	10								3	1.0	16.2	
	50								3	2.0	16.7	
20	1:43	R-2 19.7 - 24.7	60	100	63	Same as R-1, strong, unweathered 19.7-21.6' and 22.4-24.7', slightly weathered 21.6-22.4', close fracture spacing; no apparent foliation; orange discoloration 19.7-24.7'; orange sandy clay deposit < 1/16" in fractures at 21.0', 21.25', 21.4', and 21.6'; gray sand deposit < 1/16" in fracture at 23.9'	I/II	R4	60	3	2.0	17.3
	10								3	1.0	17.6	
	10								1.5	1.0	18.1	
	10								1.5	1.0	18.15	
	30								1.5	2.0	18.3	
25	1:53	R-3 24.7 - 29.7	48	80	52	Very fast drilling 24.7-25.7' that possibly encountered soft material washed out by core water. Same as R-1, slightly weathered 25.7-26.6', unweathered 26.6-29.7'; no apparent foliation; 1" quartz pocket at 28.9'; 70° healed fractures throughout; green sand deposit < 1/16" in fracture at 26.6'; orange sand deposit < 1/16" in fractures at 27.9' and 28.0'; 0.5" thick layer disintegrated rock and 0.5" thick quartz vein at 28.2'; black staining in fracture at 29.25'	I/II	R3	10	1.5	2.0	18.5
	1:40								30	1.5	2.0	18.7
	2:00								25	1.5	2.0	19.25
	2:16								50	3	3.0	21
	30								30	1.5	3.0	21.25
30	< 0:10	R-4 29.7 - 34.7	60	100	92	Same as R-1, strong, unweathered; no apparent foliation; orange discoloration 29.7-30.5'; high angle intersecting healed fractures throughout at 70° and nearly vertical; orange staining in all fractures between 30.4' and 34.3'	I	R4	60	1.5	3.0	21.4
	20								1.5	3.0	21.6	
	40								3	1.0	22.1	
	60								3	1.0	22.2	
	85								3	1.0	22.4	
35	1:50	R-5 34.7 - 39.7	60	100	100	Gray, fine to coarse grained GNEISS, very strong, unweathered, moderate fracture spacing; no apparent foliation; trace coarse grained garnet; 40-70° healed fractures throughout	I	R5	10	1.5	1.0	22.6
	1:58								50	1.5	1.0	22.75
	2:15								60	3	1.0	23.3
	2:00								70	1.5	1.0	23.6
	2:00								50	3	2.0	23.9

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
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CORING LOG

(continued)

BORING NUMBER: **Sligo 8**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
40	4:23/2ft					Same as R-5, wide fracture spacing; no apparent foliation except gneissic banding 41.0-44.0'; coarse grained garnet throughout; crushed rock infill < 0.5" thick in fracture at 40.5'	I	R5	65 40 60 80	1.5 1.5 1.5 1.0	1.0 1.0 1.0 6.0	34.9 37.3 38.6 40.5
	2:17	R-6 39.7 - 44.7	58	97	93							
	2:10											
	2:00								10	1.5	1.0	43.6
45	1:58					Same as R-5, close fracture spacing; no apparent foliation; coarse grained garnet throughout	I	R5	55	1.5	1.0	43.95
	1:56								30	1.5	1.0	44
	1:54	R-7 44.7 - 49.7	60	100	85				15	1.5	1.0	44.15
	1:58								50	1.5	1.0	45.9
	2:08								70	1.5	2.0	46.5
50	2:03					Same as R-5, very close to moderate fracture spacing; no apparent foliation; medium to coarse grained garnet throughout; 0.5" quartz pockets throughout	I	R5	40	1.5	1.0	46.7
	1:56								10	1.5	1.0	46.85
	2:10	R-8 49.7 - 54.7	60	100	87				50	1.5	1.0	47.5
	2:05								70	1.5	1.0	47.9
	2:10								20	1.5	1.0	49.1
55	4:00/2ft					Same as R-5, close fracture spacing; no apparent foliation; medium grained garnet throughout; 1" quartz pockets at 58.0' and 58.4' and < 1/8" thick quartz vein at 59.5'	I	R5	40	1.5	1.0	50.75
	1:46	R-9 54.7 - 59.7	60	100	100				10	3	1.0	52.3
	1:40								60	1.5	1.0	52.4
	1:40								10	1.5	1.0	52.5
60	2:03					Same as R-5, moderate to wide fracture spacing; very faint gneissic banding at 60'; coarse grained (< 0.25" diameter) garnet throughout; 0.5" quartz pockets throughout; hard green mineral deposit in fracture at 64.2'	I	R5	30	1.5	1.0	53.05
	2:12								50	1.5	1.0	53.2
	2:03	R-10 59.7 - 64.7	60	100	100				0	1.5	1.0	53.5
	2:05								10	1.5	1.0	54.4
	1:55								0	3	1.0	54.45
65	2:00					Same as R-5, extremely close to moderate fracture spacing; no apparent foliation; coarse grained garnet throughout; 0.5" quartz pockets throughout and 2" quartz pocket at 68.4'	I	R5	60	1.5	2.0	55.8
	2:03								60	1.5	1.0	58.1
	2:25	R-11 64.7 - 69.7	60	100	97				30	1.5	1.0	58.95
	2:30								40	1.5	2.0	59.5
	2:27								50	1.5	1.0	61.8
70	2:35					Same as R-5, moderate to wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 1" quartz pockets at approximate 8" spacing	I	R5	50	1.5	1.0	62.95
	2:30								60	1.5	2.0	64.2
	2:40	R-12 69.7 - 74.7	60	100	100				65	1.5	1.0	65.5
	2:22								5	1.5	1.0	70.6
	2:08								50	1.5	1.0	72.5

PURPLE LINE CORING LOG - PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07

CORING LOG

(continued)

BORING NUMBER: **Sligo 8**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Silver Spring, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: E. Hill

INSPECTOR: C. Nicholson

[illegible]



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **SS/T 1**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Silver Spring Avenue west of Georgia Avenue**

COORD. N: **482,513.5** E: **1,304,590.9**






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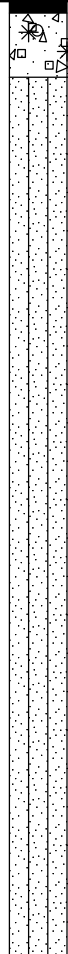



SURFACE ELEV.: **340.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/15/07** TIME: **8:30 am**

FINISH DATE: **2/15/07** TIME: **4:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		2"				3"					
Hammer Wt.		24"				5'					
Hammer Fall		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)			RQD %
5			S	1		0.0 - 2.0	2	3	4	7	12	0-0.33' Asphalt Pavement	
			S	2		2.0 - 4.0	5	7	7	7	20	Damp, medium stiff, brown and orange, Clayey SILT, some fine to medium Sand, trace mica (CL-ML) (FILL) Pocket penetrometer: 1.5tsf, pocket torvane 2.75tsf	
			S	3		4.0 - 6.0	3	2	4	5	18	Damp, medium dense, brown, fine to medium SAND, some Silt, trace mica (SM) Same as S-2, loose; faint relict rock structure (SM)	
			S	4		6.0 - 8.0	6	7	8	9	16	Damp, medium dense, mottled light gray and brown, fine to coarse SAND, some Silt, trace fine Gravel; faint relict rock structure (SM)	
			S	5		8.0 - 10.0	4	4	6	8	22	Same as S-4; distinct relict rock structue (SM)	
			S	6		13.5 - 15.0	4	6	8		18	Same as S-4, orangish brown; relict rock structure with black laminations (SM)	
			S	7		18.5 - 20.0	4	4	6		18	Same as S-4; relict rock structure (SM)	
			S	8		23.5 - 25.0	5	5	8		18	Same as S-4; relict rock structure (SM)	



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BORING LOG

(continued)

BORING NUMBER: **SS/T 1**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
												Depth Elev.	
30			S	9		28.5 - 30.0	10	10	15		18	Same as S-4, red and brown below 30'; relict rock structure with black laminations (SM)	
35			S	10		33.5 - 34.9	7	18	50/5"		16	Damp, very dense, white, gray, and orangish brown, fine to coarse SAND, some Silt, trace mica (SM)	
40			S	11		38.5 - 38.8	50/3"				2	Same as S-10 (SM)	
45			S	12		43.5 - 43.5	50/0.5"				0	Same as S-10 (SM)	
												45.25 294.85	Augered to 45.25' to prevent protrusion in street. Rock coring begun at 45.25'.
50													
55													



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CORING LOG

BORING NUMBER: **SS/T 1**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Silver Spring Avenue west of Georgia Avenue**

COORD. N: **482,513.5** E: **1,304,590.9**

STN. NO.: OFFSET:

SURFACE ELEV.: **340.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/15/07** TIME: **8:30 am**

FINISH DATE: **2/15/07** TIME: **4:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
50	1:20	R-1 45.3 - 50.0	51	89	65	Gray, fine to medium grained GNEISS, strong, slightly weathered, very close to close fracture spacing; no apparent foliation; trace mica; orange discoloration between 46.65' and 48.55'; orange stain and moderately weathered joint walls in fracture at 45.5'; black staining in fracture 47.05-47.65'; brown staining in fractures at 48.55', 49.05', and 49.25'	II	R4	60	1.5	2.0	45.5
	1:16								90	1.5	1.0	47.05
	1:13								40	1.5	1.0	47.25
	1:25								20	1.5	2.0	48.45
	1:12								20	1.5	1.0	48.55
55	1:00	R-2 50.0 - 55.0	60	100	97	Same as R-1, very strong; faint swirly bedding throughout; orange discoloration at 51.3', 52.6', and 54.4'; orange clay deposit < 1/16" in fracture at 51.3'; orange staining and slightly weathered joint walls in fracture at 52.6'; red staining in fractures at 53.5' and 54.45'; brown clay deposit < 1/16" in fractures at 53.7' and 54.15'	II	R5	0	3	1.0	49.05
	1:00								0	3	1.0	49.25
	1:00								15	1.5	1.0	50.9
	1:40								90	1.5	3.0	51.3
	1:25								35	3	2.0	52.6
60	1:15	R-3 55.0 - 60.0	60	100	56	Same as R-1, very strong, slightly weathered 55.0-59.4', extremely weathered 59.4-60.0', extremely close to close fracture spacing; no apparent foliation; orange discoloration at 57.2' and 59.3'; clay deposit < 1/16" and slightly weathered joint walls in fractures at 57.1' and 57.4'	II	R5	40	1.5	1.0	53.5
	0:55								40	3	3.0	53.7
	1:11								20	1.5	3.0	54.15
	0:30								20	3	1.0	54.45
	1:10								0	1.5	1.0	55.6
65	1:30	R-4 60.0 - 65.0	52	87	83	Same as R-1, very strong, extremely weathered 60.0-60.75', slightly weathered 60.75-65.0', extremely close to close fracture spacing; no apparent foliation; orange discoloration 60.0-60.75'; orange staining in fractures at 61.1' and 63.7'	II	R5	10	1.5	1.0	56
	1:45								10	1.5	1.0	56.3
	1:50								10	1.5	1.0	56.4
	1:40								10	1.5	3.0	57.1
	n/r*								10	1.5	3.0	57.4
70	2:00	R-5 65.0 - 70.0	60	100	100	Gray, fine to medium grained GNEISS, very strong, unweathered, close to moderate fracture spacing; no apparent foliation; orange staining in fracture at 68.2'; orange clay deposit < 1/16" in fracture at 69.25'	I	R5	25	1.5	1.0	57.65
	2:10								25	1.5	1.0	59.2
	2:30								10	1.5	3.0	59.4
	1:50								30	1.5	1.0	61.1
									20	1.5	1.0	62.38



Parsons
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CORING LOG

(continued)

BORING NUMBER: **SS/T 1**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
75	1:35	R-6 70.0 - 75.0	60	100	92	Same as R-5; no apparent foliation; trace mica	I	R5		1.5	1.0	69.65
	1:40								30	1.5	1.0	71
	1:45								20	1.5	1.0	71.75
	1:12								0	1.5	1.0	72
	1:30								30	3	1.0	72.15
80	2:22	R-7 75.0 - 80.0	60	100	100	Same as R-5, moderate to wide fracture spacing; no apparent foliation; trace mica; 30° healed fractures at 77.4' and 78.3'; gray mineral deposit in fractures at 76.85' and 79.4'	I	R5				
	2:15											
	2:10								40	3	2.0	76.85
	2:05											
	1:55								40	1.5	2.0	79.4
85	2:05	R-8 80.0 - 85.0	60	100	93	Same as R-5, moderate to wide fracture spacing; no apparent foliation; trace mica; gray mineral deposit in fractures at 81.3', 84.55', and 84.75'	I	R5				
	1:52											
	2:00								35	3	1.0	81.3
	2:00											
	1:35								10	3	1.0	84.55
90	1:45	R-9 85.0 - 90.0	60	100	100	Same as R-5, moderate to wide fracture spacing; no apparent foliation; trace mica; green staining in fracture at 88.7'	I	R5	30	3	1.0	84.75
	1:55											
	n/r											
	n/r								70	1.5	1.0	87.9
	n/r								0	1.5	1.0	88.7
90	* not recorded					Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.						
95												
100												
105												



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Douglas, Inc.

BORING LOG

BORING NUMBER: **SS/T 2**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Silver Spring Avenue west of Fenton Street**

COORD. N: **482,540.2** E: **1,305,369.4**

STN. NO.: OFFSET:

SURFACE ELEV.: **328.8 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/8/07** TIME: **9:30 am**

FINISH DATE: **3/12/07** TIME: **12:30 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	4/2/07	7:00 am	8.5	-	89.8
Length		24"				5'	4/9/07	6:50 am	6.6	-	89.8
Hammer Wt.		140lbs	Drill Rod Size				4/18/07	6:45 am	8.5	-	89.8
Hammer Fall		30"	I.D. (O.D.)				4/25/07	3:30 pm	8.5	-	89.8

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.		
5												0 018.8	0-0.3' Asphalt Pavement	
													018.8	0.3-0.7' Concrete
		S	1	1.0 - 3.0	3	2	2	4	16	028.77 028.1 327.3	S-1A (Top 6 inches): Damp, very loose, brown, medium to coarse SAND, some rounded Gravel, little clayey Silt (SM) (FILL)			
		S	2	3.0 - 5.0	4	4	4	5	24		S-1B (Bottom 10 inches): Damp, soft, bluish gray, SILT and CLAY, trace mica (CL-ML) (FILL) Pocket penetrometer: 2.25tsf			
		S	3	5.0 - 7.0	4	5	6	7	24	6.5	Damp, medium stiff, alternating gray and brown, CLAY and SILT, trace mica (CL-ML) (FILL) Pocket penetrometer: 2.25tsf, pocket torvane: 3.75tsf			
10		S	4	7.0 - 9.0	2	3	3	4	18	322.3 321.8	S-3A (Top 18 inches): Same as S-2 (CL-ML) (FILL)			
		S	5	9.0 - 11.0	4	7	7	9	18	10	S-3B (Bottom 6 inches): Damp, medium dense, gray brown, fine SAND, some Silt, trace mica (SM) (FILL)			
		S	6	13.5 - 15.0	20	19	21		8	318.8	Damp, medium stiff, finely mottled gray and white, Clayey SILT, trace fine Sand (ML) S-5A (Top 12 inches): Same as S-4 (ML) S-5B (Bottom 6 inches): Damp, medium dense, brown, fine to medium SAND and Silt, trace mica; relict rock structure (SM) Same as S-5B, dense, light brown; relict rock structure (SM)			
15		S	7	18.5 - 18.8	50/3"				3		Wet spoon hereafter. Damp, very dense, gray, fine to medium SAND, some Silt, trace mica (SM)			
		S	8	23.5 - 23.6	50/1"				0.5		Same as S-7 (SM)			



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BORING LOG

(continued)

BORING NUMBER: **SS/T 2**

SHEET NUMBER: **2** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
30			S	9	28.5 - 28.7	50/2"					0.5	Same as S-7 (SM)	
													30.35 298.45 Auger refusal and coring begun at 30.35'.
35													
40													
45													
50													
55													



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CORING LOG

BORING NUMBER: **SS/T 2**

SHEET NUMBER: 3 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **Silver Spring Avenue west of Fenton Street**

COORD. N: **482,540.2** E: **1,305,369.4**

STN. NO.: OFFSET:

DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**

SURFACE ELEV.: **328.8 feet**

DATUM: **NAD 83/91 and NAVD 88**

DRILLING METHOD: **Hollow Stem Auger**

START DATE: **3/8/07** TIME: **9:30 am**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

FINISH DATE: **3/12/07** TIME: **12:30 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"			4/2/07	7:00 am	8.5	-	89.8
O.D.:	3"			4/9/07	6:50 am	6.6	-	89.8
I.D.:	2"			4/18/07	6:45 am	8.5	-	89.8
CASING SIZE:	" (")			4/25/07	3:30 pm	8.5	-	89.8

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
35	2:51	R-1 30.4 - 34.8	54	100	96	Gray, fine grained GNEISS, very strong, unweathered, moderate fracture spacing; no apparent foliation; brown staining, gray mineral deposit and slightly weathered joint walls in fracture at 34.35'	I	R5	25	1.5	1.0	31.55
	3:10								0	1.5	1.0	32.4
	3:12								5	1.5	1.0	33.2
	2:46								5	1.5	1.0	34.2
	1:46	R-2 34.8 - 39.8	60	100	98	Same as R-1; faint swirly bedding throughout; brown staining in fracture at 37.3'	I	R5	15	3	2.0	34.35
40	1:50								30	1.5	1.0	36.05
	1:51								5	1.5	1.0	36.75
	2:00								25	1.5	1.0	37.3
	1:58								25	1.5	1.0	37.4
45	2:08	R-3 39.8 - 44.8	59	98	98	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; 0.75" quartz pocket at 42.3'; gray mineral deposit in fractures at 40.65' and 43.45'	I	R5	5	1.5	2.0	40.65
	2:05											
	2:14								45	3	2.0	43.35
	2:07											
50	2:06	R-4 44.8 - 49.8	60	100	100	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica; gray mineral deposit in fracture at 49.7'	I	R5	50	1.5	1.0	45.35
	1:55											
	2:14											
	2:19											
	2:11											
55	2:12	R-5 49.8 - 54.8	60	100	100	Same as R-1, wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet	I	R5	0	1.5	2.0	49.7
	1:49											
	2:03											
	2:06											
	2:06											
	2:07											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
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CORING LOG

(continued)

BORING NUMBER: **SS/T 2**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
60	1:59	R-6 54.8 - 59.8	58	97	97	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica	I	R5				
	2:31											
	2:34								5	3	1.0	57.9
	2:37								30	1.5	1.0	58.05
	2:29											
65	2:27	R-7 59.8 - 64.8	60	100	100	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; green staining in fracture at 63.35'	I	R5				
	2:15											
	2:19											
	2:10								30	3	1.0	63.35
	2:15											
70	2:18	R-8 64.8 - 69.8	60	100	100	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica; gray clayey sand deposit < 1/16" in fracture at 67.35'	I	R5				
	1:49											
	1:32								45	1.5	2.0	67.35
	1:46											
	1:38								45	1.5	1.0	68.8
75	2:16	R-9 69.8 - 74.8	60	100	100	Same as R-1, moderate to wide fracture spacing; no apparent foliation except gneissic banding 71.8-74.8'; trace mica; coarse grained garnet throughout; quartz pocket 1" in diameter at 70.45', pocket between 74.2' and 74.4', and vein 70.9-70.95'	I	R5				
	2:16											
	2:37								5	1.5	1.0	71.3
	2:36											
	2:27								5	3	1.0	74.1
80	2:03	R-10 74.8 - 79.8	60	100	100	Same as R-1, moderate fracture spacing; no apparent foliation; trace mica; green staining in fracture at 76.7'	I	R5				
	2:28											
	2:15								35	1.5	1.0	76.7
	2:28											
	2:05								15	1.5	1.0	78.75
85	2:07	R-11 79.8 - 84.8	60	100	100	Same as R-1, wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout	I	R5				
	2:00											
	2:04								45	1.5	1.0	82.65
	2:07											
	2:00											
90	2:08	R-12 84.8 - 89.8	60	100	100	Same as R-1; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz vein at 88.05' and 40°; green staining and slick joint walls in fracture at 86.5'; gray sand deposit < 1/16" in fracture at 87.8'	I	R5				
	1:58											
	2:05								40	1.5	2.0	86.5
	2:18								40	1.5	2.0	87.8
	2:21											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/13/07



Parsons
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CORING LOG

(continued)

BORING NUMBER: **SS/T 2**

SHEET NUMBER: **5** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
95						Bottom of boring at 89.8'. Coring down pressure and rotations per minute not recorded 30.35-34.8', 500 psi and 400 rpm 34.8-54.8', and 600 psi and 450 rpm 54.8-89.8'. Well installed with 10' screen 76'-86' and sealed with bentonite chips upon completion. See separate appendix for well installation log.						
100												
105												
110												
115												
120												
125												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
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BORING LOG

BORING NUMBER: **SS/T 3**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Wolner/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Grove Street south of Thayer Avenue**

COORD. N: **482,803.1** E: **1,306,098.6**






STN. NO.: OFFSET:

SURFACE ELEV.: **309.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/21/07** TIME: **9:30 am**

FINISH DATE: **2/22/07** TIME: **2:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		2"				3"					
Hammer Wt.		24"				5'					
Hammer Fall		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.		
													0	0-0.83' Asphalt Pavement
													0.83	
													308.27	
			S	1		2.0 - 4.0	9	7	14	9	16			Moist, medium dense, brownish red, fine to coarse SAND, some Silt, trace fine Gravel, trace mica (SM)
5			S	2		4.0 - 6.0	7	7	4	4	10			Same as S-1 (SM)
			S	3		6.0 - 8.0	3	3	2	4	6			Same as S-1, loose (SM)
			S	4		8.0 - 10.0	3	4	6	16	10		301.1	S-4A (Top 7 inches): Wet, medium dense, gray, fine to coarse GRAVEL, little fine to coarse Sand (GP)
10													9.75	
													299.35	S-4B (Bottom 3 inches): Moist, loose, brownish red, fine to medium SAND, little fine Gravel, some Silt, trace mica (SM) Wet spoon hereafter.
15			S	5		14.5 - 15.0	50/6"				5			Same as S-4B, very dense (SM)
20			S	6		19.5 - 19.8	50/4"				4			Same as S-4B, very dense, brownish gray (SM)
			S	7		24.5 - 24.6	50/1"				1			



Parsons
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BORING LOG

(continued)

BORING NUMBER: **SS/T 3**

SHEET NUMBER: **2** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Wolner/C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
													Same as S-4B, very dense, brownish gray (SM)
30			S	8		29.5 - 29.7	50/2"				2	29.5 279.6	Damp, very dense, light brown, fine to coarse SAND, trace mica; relict rock structure (SP)
												32.5 276.6	Auger refusal and coring begun at 32.5'.
35													
40													
45													
50													
55													



Parsons
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CORING LOG

BORING NUMBER: **SS/T 3**

SHEET NUMBER: **3** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Wolner/C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Grove Street south of Thayer Avenue**

COORD. N: **482,803.1** E: **1,306,098.6**

STN. NO.: OFFSET:

SURFACE ELEV.: **309.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/21/07** TIME: **9:30 am**

FINISH DATE: **2/22/07** TIME: **2:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
35	n/r*	R-1 32.5 - 34.5	23	96	75	Gray, fine to medium grained GNEISS, very strong, slightly weathered, moderate fracture spacing; faint swirly bedding throughout; trace mica; coarse grained garnet throughout	I	R5				
	n/r											
	3:18	R-2 34.5 - 39.5	60	100	98	Gray, fine to coarse grained GNEISS, very strong, slightly weathered, close fracture spacing; faint swirly bedding throughout; 1" quartz pocket at 35.95'; orange and black staining in fractures at 35.9', 36.0', and 37.9'; orange and black clay deposit < 1/16" in fractures at 36.35' and 37.5'	I	R5	10	3	1.0	34
	2:15								35	1.5	1.0	34.15
	2:06								0	1.5	1.0	34.25
	2:08								30	1.5	2.0	35.9
	1:40								20	1.5	2.0	36
40	1:54	R-3 39.5 - 44.5	60	100	62	Gray, fine to coarse grained GNEISS, very strong, slightly weathered, close fracture spacing; faint swirly bedding throughout; 1" quartz pockets at 40.6' and 42.6-43.4'; orange and black staining in fractures at 39.9', 40.8', 43.1', and 44.3'; orange and black clay deposit < 1/16" in fracture at 41.8'	I	R5	40	1.5	3.0	36.35
	1:33								10	1.5	3.0	37.5
	1:54								35	1.5	2.0	37.9
	1:21								0	1.5	2.0	38.45
	1:22								20	1.5	2.0	38.95
45	1:26	R-4 44.5 - 49.5	60	100	82	Same as R-3; faint swirly bedding throughout; 75-85° healed fractures throughout; orange and black staining in fracture at 44.75'	I	R5	60	3	1.0	39.9
	2:00								40	1.5	1.0	40.8
	1:38								85	1.5	3.0	41.8
	1:58								65	1.5	1.0	43.1
	1:28								35	3	1.0	43.6
50	1:34	R-5 49.5 - 54.5	59	98	77	Same as R-3; faint swirly bedding throughout; brown silt deposit < 1/16" in fracture at 50.7'; orange staining in fracture at 51.0'; orange staining and orange clay deposit < 1/16" in fracture at 51.65'; orange and black clay deposit < 1/16" in fractures between 51.65-52.1'; orange clay deposit in fracture at 52.3'; black staining and orange clayey sand deposit in fracture at 52.45'; orange staining in fracture at 52.8'; orange and black staining in fracture at 53.4'	I	R5	70	1.5	1.0	44.3
	2:01								45	1.5	1.0	44.75
	1:44											
	1:22								50	1.5	1.0	48.45
									50	1.5	1.0	49
55		R-6 54.5 - 59.5	60	100	63	Same as R-3, unweathered 54.5-56.6' and 56.85-59.5', moderately weathered 56.6-56.85', very close to close fracture spacing; faint swirly bedding	I/III	R5	40	3	2.0	50.7
									20	3	2.0	51
									45	3	3.0	51.65
									60	1.5	3.0	51.9
									20	1.5	3.0	52.3

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **SS/T 3**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Wolner/C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
60	1:26					throughout; orange sand deposit < 1/16" in fracture at 55.95'; friable rock 56.6-56.8'; yellow clayey sand deposit < 1/16" in fractures at 58.4-59.0' and 58.75-59.25'	I/II	R5	45	1.5	2.0	55.95
	1:44								50	1.0	4.0	56.6
	1:47								50	1.0	4.0	56.8
	1:43								40	1.5	1.0	57.2
	1:17	R-7 59.5 - 64.5	58	97	67	Same as R-3, unweathered 59.5-62.35' and 63.05-64.5', slightly weathered 62.35-63.05', very close to moderate fracture spacing; no apparent foliation except faint swirly bedding 63.0-64.5'; yellow clay deposit < 1/16" in fractures at 59.6', 59.8', 62.0', and 62.75'; yellow white silty clay deposit < 1/16" in fracture at 62.4'			40	1.5	1.0	57.65
	1:30								70	3	2.0	58.7
65	2:03						I	R5	60	3	2.0	59
	2:28					Same as R-3, moderate fracture spacing; faint swirly bedding throughout; trace mica			0	3	1.0	59.4
	2:02								65	3	3.0	59.6
	2:00	R-8 64.5 - 69.5	60	100	97				70	3	3.0	59.8
	2:48								70	3	3.0	62
	n/r								40	1.5	3.0	62.4
70	1:54					Same as R-3, close to moderate fracture spacing; no apparent foliation except faint swirly bedding 72.8-74.5'; 1" quartz pocket at 73.7'; high angle healed fractures throughout; gray sand deposit < 1/16" in fractures at 70.4' and 72.45'; gray clayey sand deposit < 1/8" in fracture at 70.6'	I	R5	60	1.5	3.0	62.75
	1:49								30	1.5	2.0	62.85
	2:01	R-9 69.5 - 74.5	60	100	88				55	1.5	2.0	63.05
	2:00								5	1.5	1.0	64
	2:48								60	1.5	1.0	67.5
	2:48								10	1.5	1.0	69.05
75	3:03					Same as R-3, moderate fracture spacing; no apparent foliation except faint swirly bedding 74.9-76.6'	I	R5	60	3	2.0	70.4
	2:29								50	1.5	3.0	70.6
	2:28	R-10 74.5 - 79.5	60	100	85				60	3	1.0	71.9
	2:40								30	1.5	2.0	72.45
	2:42											
	2:51					Same as R-3, moderate to wide fracture spacing; no apparent foliation; 60-80° healed fractures throughout	I	R5	70	3	1.0	76.9
80	2:16								0	1.5	1.0	77.7
	2:17	R-11 79.5 - 84.5	60	100	80				70	3	1.0	78.3
	2:18								0	1.5	1.0	79.1
	3:07								80	3	1.0	79.9
	3:07											
85	2:20					Same as R-3, wide fracture spacing; no apparent foliation except faint swirly bedding 87.3-89.5'; trace mica 87.3-89.5'; 60-80° healed fractures throughout	I	R5	55	1.5	1.0	83.3
	2:56											
	2:46	R-12 84.5 - 89.5	60	100	100							
	3:10											
	3:12											
	3:02					Same as R-3, moderate to wide fracture spacing; faint swirly bedding throughout; trace mica; 1-2" quartz pockets 92.5-93.1'; 70-90° healed fractures throughout	I	R5				
90	3:05											
	2:40	R-13 89.5 - 94.5	60	100	100				75	1.5	1.0	91.25

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **SS/T 3**

SHEET NUMBER: **5** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Wolner/C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
95	2:51						I	R5	65	1.5	1.0	92
	3:01											
	n/r	R-14 94.5 - 99.5	60	100	80	Same as R-3, moderate fracture spacing; faint swirly bedding throughout; 1/8" thick vein of hard white grains at 97.7'; green clay deposit < 1/16" in fracture at 95.45'			90	1.5	1.0	94.25
	n/r								90	3	3.0	95.45
	2:11								30	3	1.0	95.5
1:58												
1:54												
100 *	not recorded					Bottom of boring at 99.5'. Coring down pressures varied between 700 psi and 1700 psi as follows: 700 psi 32.5-33.5', 900 psi 33.5-34.5', 700 psi 34.5-35.5', 900 psi 35.5-43.5', 1000 psi 43.5-44.5', 900 psi 44.5-51.5', 700 psi 51.5-55.5', 1100 psi 55.5-59.5', 800 psi 59.5-61.5', 900 psi 61.5-64.5', 1000 psi 64.5-65.5', 1100 psi 65.5-67.5', 1300 psi 67.5-72.5', 1400 psi 72.5-74.5', 1600 psi 74.5-76.5', 1700 psi 76.5-79.5', 900 psi 79.5-83.5', 1000 psi 83.5-88.5', 1200 psi 88.5-98.5', and 1300 psi 98.5-99.5'. Coring rotations per minute varied between 300 and 400 rpm. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.						
105												
110												
115												
120												
125												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **SS/T 4**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Centerline of Thayer Avenue**

COORD. N: **483,111.7** E: **1,306,910.8**






STN. NO.: OFFSET:


SURFACE ELEV.: **310.0 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/5/07** TIME: **9:30 am**

FINISH DATE: **3/6/07** TIME: **3:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	3/6/07	9:15 am	17.1	15.8	60.0
Length		24"				5'	3/12/07	1:30 pm	14.6	-	100.0
Hammer Wt.		140lbs	Drill Rod Size				4/2/07	7:10 am	13.1	-	100.0
Hammer Fall		30"	I.D. (O.D.)				4/9/07	7:00 am	14.1	-	100.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
			S	1	0.3 - 2.3	10	5	4	4	4	0-0.33' Asphalt Pavement		
			S	2	2.3 - 4.3	5	3	4	6	24	0.33-2.33' Dry, loose, brown, GRAVEL and Sand (GP) (FILL) (Pavement subgrade)		
5			S	3	4.3 - 6.3	3	4	4	6	24	307.67-4.33' Damp, loose, orangish brown, Clayey SILT, little fine Sand (CL-ML) Pocket penetrometer: 2.0tsf, pocket torvane 3.75tsf		
			S	4	6.3 - 8.3	7	10	11	10	24	4.33-305.67' Damp, loose, brown, fine SAND, some clayey Silt, trace mica (SM) Damp, medium dense, mottled white and brown, fine SAND, some clayey Silt, trace mica (SM)		
10			S	5	8.3 - 10.3	6	8	10	12	24	305.67-15.75' Damp, loose, brown, fine SAND, some clayey Silt, trace mica (SM) Same as S-4; relict rock structure (SM)		
15											15.75-294.25' Significant auger chatter at 13.5'. No standard penetration test conducted while attempting to seat augers at top of rock. Augered to 15.8' to prevent protrusion in street. Rock coring begun at 15.8'.		
20													



Parsons
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CORING LOG

BORING NUMBER: **SS/T 4**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Centerline of Thayer Avenue**

COORD. N: **483,111.7** E: **1,306,910.8**

STN. NO.: OFFSET:

SURFACE ELEV.: **310.0 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/5/07** TIME: **9:30 am**

FINISH DATE: **3/6/07** TIME: **3:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
3/6/07	9:15 am	17.1	15.8	60.0
3/12/07	1:30 pm	14.6	-	100.0
4/2/07	7:10 am	13.1	-	100.0
4/9/07	7:00 am	14.1	-	100.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
20	n/r*	R-1 15.8 - 20.0	51	102	70	Gray, medium grained GNEISS, very strong, slightly weathered, very close fracture spacing; no apparent foliation; 0.75" quartz pocket at 17.1'; 85° healed fractures between 16.75' and 17.05'; brown staining and slightly weathered joint walls in fractures at 16.0', 17.0', 17.35', 18.0', 18.2' Water loss at 16.5'	II	R5	30	3	2.0	16
	2:01								0	1.5	2.0	16.35
	1:40								0	1.5	2.0	16.45
	2:03								5	1.5	2.0	16.55
	2:03								5	1.5	2.0	17
	1:32	R-2 20.0 - 25.0	52	87	70	Gray, fine to medium grained GNEISS, very strong, slightly weathered, close fracture spacing; no apparent foliation; high angle healed fractures between 20.35' and 21.2'; brown staining in all fractures between 20.35' and 22.75'; brown sand infill < 0.25" in fractures at 22.35' and 22.75'	II	R5	10	1.5	2.0	17.35
	1:41								70	1.5	2.0	17.6
	1:52								60	1.5	2.0	17.85
	1:33								30	1.5	2.0	18
	2:29								30	1.5	2.0	18.2
25	1:30	R-3 25.0 - 30.0	58	97	87	Gray, fine to medium grained GNEISS, very strong, unweathered, very close to close fracture spacing; no apparent foliation; brown sand deposit < 1/16" and slightly weathered joint walls in fractures at 26.1', 27.0', and 29.7'; brown sand deposit in fracture at 27.2'; brown sand deposit < 1/16" and orange discoloration 1" around slightly weathered joint walls in fracture at 28.55'	I	R5	30	3	1.0	21.1
	1:23								10	1.0	4.0	21.2
	1:29								45	1.0	4.0	22.35
	1:44								30	1.5	2.0	22.75
	0:43								30	1.5	2.0	26.1
	1:20	R-4 30.0 - 35.0	60	100	88	Same as R-3; no apparent foliation; orange discoloration 30.95-31.6' and 32.0-32.85'; brown staining in fractures at 30.95' and 32.85'; brown sand deposit < 1/16" in fractures at 33.7', 34.6', and 34.75'; orange clayey sand deposit < 0.25" in fracture at 34.45'	I	R5	30	1.5	2.0	27
	1:23								0	1.5	2.0	27.2
	1:24								30	1.5	2.0	27.2
	1:31								30	1.5	2.0	28.55
	1:20								10	3	1.0	28.9
35	1:31	R-5 35.0 - 40.0	60	100	100	Gray, fine grained GNEISS, very strong, unweathered, close to moderate fracture spacing; no apparent foliation except faint swirly bedding 35.0-37.0'; orange staining in fracture at 39.1'; orange clay deposit < 0.25" in fracture at 39.7'	I	R5	0	1.5	2.0	29.7
	1:43								25	3	1.0	29.8
	1:42								40	1.5	1.0	30.95
	1:34								50	1.5	1.0	32.85
	1:59								0	1.5	2.0	33.7
	1:31								0	1.0	6.0	34.45
	1:43								0	1.5	2.0	34.6
	1:42								0	1.5	2.0	34.75
	1:34								25	1.5	1.0	36.5
	1:31								25	1.5	1.0	38
40	1:31								0	1.5	1.0	39.1
	1:31								5	1.5	1.0	39.15

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **SS/T 4**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	1:39	R-6 40.0 - 45.0	60	100	97	apparent foliation; nearly vertical healed fracture from 43.45' to 43.95'; orange staining in fracture at 43.5'	I	R5	20	1.0	6.0	39.7
	1:25								50	1.5	1.0	43.3
	1:32								50	1.5	1.0	43.5
	1:30	R-7 45.0 - 50.0	60	100	95	Same as R-5, close to wide fracture spacing; no apparent foliation; 5° healed fracture at 47.3'; slightly weathered joint walls in fracture at 45.5'; orange staining in fractures at 46.1' and 46.6'	I	R5	45	1.5	1.0	44
	1:38								0	3	1.0	44.45
50	1:27								45	1.5	2.0	45.5
	1:42								45	1.5	1.0	46.1
	1:41								0	1.5	1.0	46.6
55	1:43								20	1.5	1.0	47
	1:29	R-8 50.0 - 55.0	60	100	100	Same as R-5, close to wide fracture spacing; no apparent foliation; orange staining in fracture at 51.3'	I	R5	30	1.5	1.0	50.65
	1:29								25	1.5	1.0	51.3
	1:34											
	1:55	R-9 55.0 - 60.0	60	100	100	Same as R-5, moderate fracture spacing; no apparent foliation; gray sand deposit < 1/16" in fracture at 58.95'	I	R5	20	1.5	1.0	54
60	1:38								15	1.5	1.0	56.15
	1:53								30	1.5	1.0	57.8
	1:53								25	1.5	2.0	58.95
	2:09											
65	1:45	R-10 60.0 - 65.0	60	100	100	Same as R-5, moderate fracture spacing; no apparent foliation; 1" vein of white grains with coarse grained garnets in fracture at 64.1'	I	R5	0	3	1.0	60.8
	1:30								0	1.5	1.0	62.05
	1:37								5	1.5	1.0	62.9
	2:07								20	1.5	0.75	64.1
	2:10											
70	2:20	R-11 65.0 - 70.0	60	100	100	Same as R-5, moderate to wide fracture spacing; no apparent foliation; coarse grained garnet throughout	I	R5	30	1.5	1.0	66
	1:57								0	1.5	1.0	66.75
	2:15											
	3:18								20	1.5	1.0	69.2
	3:05											
75	2:14	R-12 70.0 - 75.0	60	100	100	Same as R-5, moderate fracture spacing; no apparent foliation; coarse grained garnet throughout; green staining in fractures at 72.0' and 73.3'	I	R5	0	1.5	1.0	71.25
	2:34								40	1.5	1.0	72
	2:09								25	1.5	1.0	73.3
	2:10								0	1.5	1.0	74.1
	2:01								25	1.5	1.0	74.7
75	2:02					Same as R-5, moderate to wide fracture spacing; no	I	R5				
	2:11											
	2:21											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **SS/T 4**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
80	2:09	R-13 75.0 - 80.0	60	100	100	apparent foliation; coarse grained garnet throughout	I	R5	25	1.5	1.0	76.25
	2:13								0	1.5	1.0	78.8
	2:14								25	1.5	1.0	79.5
	2:01											
85	n/r	R-14 80.0 - 85.0	60	100	100	Same as R-5, wide fracture spacing; no apparent foliation; coarse grained garnets throughout	I	R5				
	2:33											
	2:19								25	1.5	1.0	82
	2:24											
90	1:40	R-15 85.0 - 90.0	60	100	95	Same as R-5, moderate to wide fracture spacing; no apparent foliation; coarse grained garnet throughout; green staining and sand deposit < 1/16" in fracture at 85.05'	I	R5	5	1.5	1.0	84.5
	2:05								30	1.5	2.0	85.05
	2:08								30	1.5	1.0	85.35
	2:22								30	3	1.0	86.05
95	2:20	R-16 90.0 - 95.0	60	100	100	Same as R-5, moderate to wide fracture spacing; no apparent foliation; coarse grained garnets throughout	I	R5	30	1.5	1.0	88.4
	2:19											
	2:07								30	1.5	1.0	91.3
	2:18								5	1.5	1.0	92.6
100	2:13	R-17 95.0 - 100.0	60	100	100	Same as R-5, wide fracture spacing; no apparent foliation; coarse grained garnets throughout	I	R5	30	1.5	1.0	93.65
	2:13											
	2:09											
	2:04											
105	1:46	R-17 95.0 - 100.0	60	100	100		I	R5				
	1:57											
	1:55											
	1:56											
110	* not recorded					Bottom of boring at 100'. Coring down pressure 350 psi and 350 rpm 17.5-20.0', 400 psi and 350 rpm 20.0-30.0', 500 psi and 500 rpm 30.0-60.0', 400 psi and 500 rpm 60.0-100.0'. Well installed with 10' screen 86'-96' and sealed with bentonite chips upon completion. See separate appendix for well installation log.						



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BORING LOG

BORING NUMBER: **SS/T 5**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson/D. Payne**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South parking lane of Silver Spring Avenue**

COORD. N: **482,603.5** E: **1,306,843.9**

STN. NO.: OFFSET:

SURFACE ELEV.: **300.5 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/16/07** TIME: **10:30 am**

FINISH DATE: **2/20/07** TIME: **4:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	2/28/07	8:00 am	9.0	-	90.5
Length		24"				5'	3/5/07	7:45 am	10.5	-	90.5
Hammer Wt.		140lbs	Drill Rod Size				3/12/07	1:15 pm	12.6	-	90.5
Hammer Fall		30"	I.D. (O.D.)				4/2/07	7:05 am	15.5	-	90.5

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %			
												Depth Elev.		
						0.0 - 0.8							0	0-0.83' Asphalt Pavement
						0.8 - 1.3							0.835	0.83-1.33' Dry, gray, GRAVEL (GP) (FILL)
			S	1		1.5 - 3.0	15	7	6		10	299.67	199.67	(Pavement subbase)
			S	2		2.0 - 4.0	5	4	7	8	24			Damp, medium dense, brown, fine SAND, some Silt, trace mica (SM)
														Same as S-1, little fine Gravel (SM)
5			S	3		5.0 - 7.0	5	9	12	21	20			Same as S-1, little fine Gravel; faint relict rock structure (SM)
			S	4		7.0 - 9.0	12	24	40	50	24			Damp, very dense, mottled gray and brown, fine to medium SAND, little Silt (SM)
10			S	5		9.0 - 10.3	25	39	50/3"		12	291.5	9	Damp, very dense, gray and brown, fine to coarse SAND, trace Silt, trace mica (SP-SM)
												12	288.5	Auger refusal and coring begun at 12.0'.
15														
20														



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CORING LOG

BORING NUMBER: **SS/T 5**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson/D. Payne**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South parking lane of Silver Spring Avenue**

COORD. N: **482,603.5** E: **1,306,843.9**

STN. NO.: OFFSET:

SURFACE ELEV.: **300.5 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/16/07** TIME: **10:30 am**

FINISH DATE: **2/20/07** TIME: **4:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
2/28/07	8:00 am	9.0	-	90.5
3/5/07	7:45 am	10.5	-	90.5
3/12/07	1:15 pm	12.6	-	90.5
4/2/07	7:05 am	15.5	-	90.5

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
15	2:40	R-1 12.0 - 15.5	42	99	89	Gray, medium grained GNEISS, medium strong, unweathered, very close to moderate fracture spacing; faint swirly bedding throughout; green staining in fracture at 12.25'; brown mineral deposit in fractures at 14.95' and 15.1'	I	R3	0	3	1.0	12.25
	2:25								0	3	2.0	14.95
	2:15								10	3	2.0	15.1
20	4:20/1.5ft	R-2 15.5 - 20.5	59	98	85	Same as R-1, close to moderate fracture spacing; faint swirly bedding throughout; green staining in fractures at 17.9' and 18.6'; green mineral deposit and slightly weathered joint walls in fracture at 18.75'; brown clay deposit < 0.25" and slightly weathered joint walls in fracture at 19.5'	I	R3	45	3	1.0	17.9
	2:40								0	3	1.0	18.6
	2:20								50	1.0	2.0	18.75
	2:40								30	1.0	6.0	19.5
	2:20								10	1.5	1.0	21.5
25	3:05/2ft	R-3 20.5 - 25.5	60	100	100	Same as R-1, moderate to wide fracture spacing; faint swirly bedding throughout; quartz vein between 20.5' and 20.83'; gray staining in fracture at 21.5'	I	R3				
	1:40											
	2:05											
30	20min/5ft*	R-4 25.5 - 30.5	60	100	100	Gray, medium grained GNEISS, medium strong, slightly weathered, wide fracture spacing	II	R3				
35	20min/5ft*	R-5 30.5 - 35.5	59	98	95	Same as R-4	II	R3	45	4	4.0	31.3
	10min/5ft*					Same as R-4, moderate fracture spacing; vertical fracture 37.5-30.5'	II	R3				



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CORING LOG

(continued)

BORING NUMBER: **SS/T 5**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson/D. Payne**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
40	10min/5ft*	R-6 35.5 - 40.5	60	100	58		II	R3	75	1.0	1.0	37.5
						Same as R-4			90	3	0.75	39
45	10min/5ft*	R-7 40.5 - 45.5	60	100	100		II	R3				
						Same as R-4, moderate to wide fracture spacing			60	1.0	0.75	47
50		R-8 45.5 - 50.5	60	100	96		II	R3				
						Same as R-4, moderate to wide fracture spacing						
55		R-9 50.5 - 55.5	60	100	97		II	R3	45	3	1.0	54.5
						Same as R-4, close to moderate fracture spacing			0	1.5	1.0	57.25
60	30min/5ft*	R-10 55.5 - 60.5	59	98	97		II	R3	55	1.5	2.0	59.25
						Same as R-4, close to moderate fracture spacing; red staining in fracture at 61.3'			55	1.5	2.0	60
65		R-11 60.5 - 65.5	60	100	90		II	R3	0	1.5	1.0	60.4
						Same as R-4			60	1.5	1.0	61.23
70							II	R3	0	1.5	1.0	62.75
		R-12 65.5 - 70.5	60	100	100				45	3	1.0	62.83
									45	3	1.0	63.42
									20	1.5	1.0	64.2
									0	1.5	1.0	64.83
									0	1.5	1.0	65.16
						Same as R-4	II	R3				



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CORING LOG

(continued)

BORING NUMBER: **SS/T 5**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson/D. Payne**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
75		R-13 70.5 - 75.5	59	98	95							
						Same as R-4	II	R3				
80		R-14 75.5 - 80.5	60	100	83							
						Same as R-4	II	R3				
85		R-15 80.5 - 85.5	60	100	100							
						Same as R-4	II	R3				
90		R-16 85.5 - 90.5	60	100	100							
	* approximate					Bottom of boring at 90.5'. Coring down pressure and rotations per minute not recorded. Well installed with 10' screen 78'-88' and sealed with bentonite chips upon completion. See separate appendix for well installation log.						
95												
100												
105												

BORING LOG

BORING NUMBER: SS/T 6

SHEET NUMBER: 1 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Silver Spring, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: E. Hill

INSPECTOR: C. Nicholson

DRILLING METHOD: Hollow Stem Auger

RIG TYPE: Ford F700 truck mounted CME 55 with automatic hammer

LOCATION: South parking lane of Thayer Avenue

COORD. N: 483,183.8 E: 1,307,629.9






STN. NO.: OFFSET:

SURFACE ELEV.: 270.4 feet

DATUM: NAD 83/91 and NAVD 88

START DATE: 2/23/07 TIME: 10:15 am

FINISH DATE: 2/26/07 TIME: 3:05 pm

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
		1.375"				2"					
		2"				3"					
		24"				5'					
		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
			S	1		0.0 - 2.0	5	7	5	10	12	0	0-0.33' Asphalt Pavement
			S	2		2.0 - 4.0	7	7	4	3	10	2.66	Damp, medium dense, brown, fine to coarse SAND, some medium Gravel, some clayey Silt (SM) (FILL)
			S	3		4.0 - 6.0	2	2	woh	woh	6	267.74	S-2A (Top 8 inches): Dry, medium dense, gray, subangular GRAVEL (GP) (FILL)
5			S	4		6.0 - 8.0	1	1	1	1	10		S-2B (Bottom 2 inches): Damp, medium dense, brown, fine to coarse SAND and fine Gravel, little clayey Silt (SM) (Possible FILL)
			S	5		8.0 - 10.0	1	woh	woh	1	8		Same as S-2B, loose (SM)
10													
			S	6		13.5 - 14.8	6	15	50/3"		14		Damp, very dense, brown, fine to medium SAND, little silt, trace mica; relict rock structure (SM)
15													
												17.5	Auger refusal and coring begun at 17.5'.
20												252.9	



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CORING LOG

BORING NUMBER: **SS/T 6**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **South parking lane of Thayer Avenue**

COORD. N: **483,183.8** E: **1,307,629.9**

STN. NO.: OFFSET:

SURFACE ELEV.: **270.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/23/07** TIME: **10:15 am**

FINISH DATE: **2/26/07** TIME: **3:05 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
20	n/r*	R-1 17.5 - 20.0	21	70	37	Very fast drilling 17.5-18.2' that possibly encountered soft material washed out by core water. Gray, medium to coarse grained GNEISS, strong, slightly weathered, very close fracture spacing; faint swirly bedding throughout; trace mica; brown clayey sand deposit < 1/16" in fractures at 18.65', 19.05', and 19.2'. Water loss at 17.5'. Gray, medium grained GNEISS, strong, unweathered, close to moderate fracture spacing; faint swirly bedding throughout; trace mica; trace coarse grained garnet	II	R4	0	3	1.0	18.35
	n/r								15	3	1.0	18.5
	1:30	R-2 20.0 - 25.0	60	100	90		I	R4	15	3	3.0	18.65
	1:34								20	3	3.0	19.05
	1:31						20	3	3.0	19.2		
	1:51						20	3	2.0	19.3		
	1:26						40	3	1.0	19.5		
	1:36						15	1.5	1.0	20.8		
25	1:51	R-3 25.0 - 30.0	60	100	80		I	R4	70	1.5	1.0	21
	1:26								0	1.5	1.0	22.3
	1:48					0	1.5	1.0	22.7			
	1:36					0	1.5	1.0	24.3			
	1:40					0	1.5	1.0	24.55			
	1:37					25	3	2.0	26			
	30	0:52	R-4 30.0 - 35.0	57	95	95	I	R4	25	1.5	1.0	26.25
		1:24							0	1.5	1.0	27.85
1:30		0					1.5	1.0	28.1			
1:20		3					1.0	28.4				
1:41		15					1.5	1.0	32.7			
1:33		R-5 35.0 - 40.0					60	100	100	I	R4	70
1:45			0	1.5	1.0	36.4						
40		1:30	R-6				I	R4	1:27	70	1.5	2.0
	1:27	60							1.5	1.0	40.95	
	1:24	70							1.5	1.0	41.2	
	1:32											



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CORING LOG

(continued)

BORING NUMBER: **SS/T 6**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
45	1:37	40.0 - 45.0	60	100	97	and 41.2'	I	R4				
	1:28								60	1.5	2.0	43.7
	1:40								0	1.5	1.0	44.2
	1:39								0	1.5	1.0	44.4
	1:27								0	3	1.0	45.95
50	1:23	R-7 45.0 - 50.0	60	100	95	Same as R-2, moderate to wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout	I	R4	50	1.5	1.0	47.15
	1:10											
	1:18											
	1:31								0	1.5	1.0	49.6
	1:22								70	3	1.0	50
55	1:27	R-8 50.0 - 55.0	60	100	100	Same as R-2, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; green staining in fracture at 50.0'	I	R4	10	1.5	1.0	50.4
	1:35											
	1:31								0	1.5	1.0	53.7
	1:20								50	1.5	1.0	55.2
	1:30								50	1.5	1.0	55.5
60	1:37	R-9 55.0 - 60.0	58	97	87	Same as R-2, very close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; quartz lens between 59.2' and 59.4'; green staining in all fractures between 55.5' and 58.5'; gray mineral deposit in fracture at 59.45'	I	R4	0	1.5	1.0	56.65
	1:20								50	3	1.0	57.2
	1:10								50	1.5	1.0	58
	1:10								45	1.5	1.0	58.5
	1:10								0	3	2.0	59.45
65	0:54	R-10 60.0 - 65.0	60	100	83	Same as R-2; no apparent foliation; trace mica; trace coarse grained garnet; quartz lens at 62.2'; green staining in fracture at 60.2'; 0.25-0.5" gravel and sand infill in fractures at 61.5' and 61.7'; gray mineral deposit in fracture at 63.15'	I	R4	0	1.5	1.0	60.2
	1:26								45	1.5	1.0	60.7
	1:41								15	1.0	2.0	61.5
	1:44								20	1.0	2.0	61.7
	1:29								10	1.5	1.0	62.2
70	1:36	R-11 65.0 - 70.0	60	100	100	Same as R-2, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet	I	R4	45	1.5	1.0	62.9
	1:17								10	1.5	1.0	62.95
	1:21								15	1.5	2.0	63.15
	1:15								20	1.5	1.0	63.95
	1:13								20	1.5	1.0	64.9
75	0:55	R-12 70.0 - 75.0	60	100	97	Same as R-2, close to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet	I	R4	0	1.5	1.0	65.5
	1:17								10	1.5	1.0	68.95
	1:19								30	1.5	1.0	70.8
	1:15								30	1.5	1.0	73.2
	1:03								30	1.5	1.0	73.65
	1:00	R-13				Same as R-2, wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet	I	R4	0	1.5	1.0	74.85
	1:15								50	1.5	1.0	75.15



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CORING LOG

(continued)

BORING NUMBER: **SS/T 6**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
80	1:11	75.0 - 80.0	58	97	92	Same as R-2; no apparent foliation; trace mica; trace coarse grained garnet; gray mineral deposit in fracture at 83.0'	I	R4	10	1.5	1.0	77.45
	1:15											
	1:27											
	1:31											
	1:35											
85	1:21	R-14 80.0 - 85.0	60	100	92	Same as R-2, sound 85.0-89.55', extremely fractured 89.55-90.0'; no apparent foliation; trace mica; trace coarse grained garnet; gray staining in fracture at 88.1'; green mineral deposit in fracture at 88.9'	I	R4	0	1.5	1.0	79.55
	1:24											
	1:28											
	1:30											
	1:10											
90	1:16	R-15 85.0 - 90.0	60	100	85	Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded 17.5-20.0'; 300 psi and 450 rpm 20.0-25.0', 400 psi and 400 rpm 25.0-40.0', 500 psi and 450 rpm 40.0' to bottom of hole. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.			70	1.5	1.0	81.65
	0:57											
	0:57											
	* not recorded											
95												
100												
105												
110												



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BORING LOG

BORING NUMBER: **Wayne 1**

SHEET NUMBER: 1 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Bonifant St west of Georgia Ave**

COORD. N: **483,195.6** E: **1,304,554.1**






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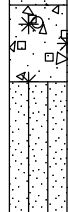








SURFACE ELEV.: **353.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/14/07** TIME: **8:00 am**

FINISH DATE: **3/14/07** TIME: **4:30 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"					
Length		24"				5'					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
Depth Elev.													
5			S	1		0.3 - 2.3	woh	2	3	2	16	0-0.25' Concrete	
			S	2		2.3 - 4.3	2	2	3	4	24	Moist, medium stiff, brown, Clayey SILT, little medium Gravel, little coarse Sand, trace mica (ML) (FILL)	
			S	3		4.3 - 6.3	3	3	3	5	24	Damp, loose, brown, fine SAND and Silt, trace mica; faint relict rock structure (SM)	
			S	4		6.3 - 8.3	5	4	5	6	18	Damp, loose, brown, fine SAND, some Silt, trace mica; faint relict rock structure (SM)	
			S	5		8.3 - 10.3	2	4	6	7	24	Same as S-4; faint relict rock structure (SM)	
			S	6		13.5 - 15.0	9	14	16		16	Damp, medium dense, light brown, fine to medium SAND, little Silt, trace mica; faint relict rock structure (SM)	
			S	7		18.5 - 20.0	5	13	17		18	Same as S-6, gray and orangish brown; relict rock structure (SM)	
			S	8		23.5 - 24.5	31	50/6"			12	Damp, very dense, grayish brown, fine SAND, little Silt, trace mica; relict rock structure (SM)	



Parsons
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BORING LOG

(continued)

BORING NUMBER: **Wayne 1**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.		
			S	9	28.5 - 28.6	50/1"					1	28.5 324.9	Dry, very dense, gray, angular GRAVEL (GP)	
													33.75 319.65	Auger refusal and coring begun at 33.8'.



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CORING LOG

BORING NUMBER: **Wayne 1**

SHEET NUMBER: 3 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Silver Spring, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **Bonifant St west of Georgia Ave**

COORD. N: **483,195.6** E: **1,304,554.1**

STN. NO.: OFFSET:

DRILLER: **E. Hill**
INSPECTOR: **C. Nicholson**

SURFACE ELEV.: **353.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

DRILLING METHOD: **Hollow Stem Auger**
RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

START DATE: **3/14/07** TIME: **8:00 am**

FINISH DATE: **3/14/07** TIME: **4:30 pm**

CORE BARREL DATA:		NOTES:		GROUNDWATER DATA				
TYPE:	NX			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
CORE SIZE:	2"							
O.D.:	3"							
I.D.:	2"							
CASING SIZE:	" (")							

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
35	1:40	R-1 33.8 - 34.9	13	100	100	Gray, fine to medium grained GNEISS, strong, unweathered, moderate fracture spacing; swirly bedding throughout; trace mica; coarse grained garnet throughout; 50° healed fractures between 33.75' and 34.35'; gray mineral deposit in fracture at 34.4'	I	R4	15	1.5	0.75	34.4
	3:29/2ft	R-2 34.9 - 39.9	35	58	43	Gray, fine grained GNEISS, strong, slightly weathered, very close to close fracture spacing; joints in core are discontinuous such that bottom 10" of recovery is primarily rounded core stones; no apparent foliation; trace mica; trace coarse grained garnet; green staining, gray sand deposit < 1/16", and slightly weathered joint walls in all fractures between 34.85' and 39.85'	II	R4				
40	0:53	R-3 39.9 - 44.9	60	100	100	Gray, fine grained GNEISS, strong, slightly weathered, moderate to wide fracture spacing; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; green sand deposit < 1/16" in fracture at 40.8'; green staining in fracture at 41.4'	I	R4	5 30	1.5 1.5	2.0 1.0	40.8 41.4
	1:57											
45	1:42	R-4 44.9 - 49.9	60	100	100	Same as R-3; faint swirly bedding throughout; 45-65° healed fractures with hard white infill < 1/16" throughout	I	R4	5 30	1.5 1.5	2.0 2.0	50.4 50.95
	1:36											
50	1:37	R-5 49.9 - 54.9	60	100	92	Same as R-3, close to wide fracture spacing; faint swirly bedding throughout; trace mica; trace coarse grained garnet; gray mineral deposit in fractures at 49.95' and 50.15'; green sand deposit < 1/16" in fracture at 50.4'	I	R4	45 50 90	1.5 1.5 1.5	2.0 2.0 2.0	50.4 50.95 51.15
	1:35											
55	1:29					Bottom of boring at 54.85'. Coring down pressure and rotations per minute not recorded. No accurate groundwater depth measurement could be obtained due to introduction of water for rock coring.						
	1:18											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
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Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 1**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
60						Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Surface restored with concrete patch.						
65												
70												
75												
80												
85												
90												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Wayne 3**

SHEET NUMBER: 1 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Thayer Avenue west of Fenton Street**

COORD. N: **483,072.3** E: **1,305,658.8**






STN. NO.: OFFSET:

SURFACE ELEV.: **328.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/28/07** TIME: **9:30 am**

FINISH DATE: **3/1/07** TIME: **2:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	3/1/07	9:00 am	9.0	8.0	49.8
Length		24"				5'					
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
												Depth Elev.	
			S	1		0.4 - 2.4	6	6	5	5	19	0-0.416' Asphalt Pavement	
			S	2		2.4 - 4.4	5	8	8	7	15	Damp, medium dense, brown, fine SAND, some clayey Silt, trace mica (SM)	
5			S	3		4.4 - 6.4	4	9	10	20	19	Same as S-1 (SM)	
			S	4		6.4 - 7.1	27	50/2"			7	Same as S-1, very dense; relict rock structure (SM)	
												Auger refusal and coring begun at 8.0'.	
10													
15													
20													



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Quade &
Douglas, Inc.

CORING LOG

BORING NUMBER: **Wayne 3**

SHEET NUMBER: **2** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Thayer Avenue west of Fenton Street**

COORD. N: **483,072.3** E: **1,305,658.8**

STN. NO.: OFFSET:

SURFACE ELEV.: **328.4 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **2/28/07** TIME: **9:30 am**

FINISH DATE: **3/1/07** TIME: **2:00 pm**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
3/1/07	9:00 am	9.0	8.0	49.8

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
10	n/r*	R-1 8.0 - 9.8	14	67	62	Gray, fine grained GNEISS, medium strong, unweathered, moderate fracture spacing; faint swirly bedding throughout; trace mica; brown discoloration, 1" around either side of fractures at 8.1' and 9.05' Same as R-1; faint swirly bedding throughout; 0.5" diameter gray mineral deposit and slightly altered joints walls in fractures at 10.1' and 11.2'	I	R3	0	3	3.0	8.1
	1:24						I	R3	40	3	1.0	9.05
	1:40								0	3	2.0	10.1
	1:47								60	3	2.0	11.2
15	1:36	R-2 9.8 - 14.8	60	100	97	Same as R-1, moderate fracture spacing except extremely close fracture spacing 17.25-17.4'; faint swirly bedding throughout; brown clayey sand deposit < 1/16" in fractures at 15.55', 17.25', and 17.4'	I	R3	5	3	1.0	12.4
	1:44											
	1:16								45	1.5	3.0	15.55
	1:11								0	1.5	3.0	17.25
20	1:05	R-3 14.8 - 19.8	60	100	98	Same as R-1, very close to close fracture spacing; swirly bedding throughout; 0.5" quartz pockets throughout; brown staining and slightly weathered joint walls in fracture at 20.0'; gray mineral deposit in fracture at 21.4'; brown sand deposit < 1/16" in fracture at 22.1'	I	R3	25	3	3.0	17.4
	1:18											
	1:22											
	0:59								30	1.5	2.0	20
25	1:08	R-4 19.8 - 24.8	59	98	85	Same as R-1, close to moderate fracture spacing; gneissic banding at 20" throughout; gray mineral deposit < 0.25" diameter in fracture at 25.3'	I	R3	0	1.5	1.0	20.5
	n/r								0	3	1.0	20.8
	1:03								15	1.5	2.0	21.4
	1:10								30	1.5	2.0	22.1
30	1:20					Same as R-1, strong, very close to moderate fracture spacing; no apparent foliation; gray mineral deposit in fracture at 31.75'	I	R4	20	1.0	3.0	22.3
	1:07	R-5 24.8 - 29.8	60	100	100				5	1.5	1.0	22.7
	1:05								45	1.5	1.0	23.2
	1:49								0	3	1.0	24.7
30	1:05								85	1.5	2.0	25.3
	1:34											
	1:36	R-6 29.8 - 34.8	60	100	85				5	1.5	1.0	31.1
	1:36								0	1.5	1.0	31.6
									85	1.5	3.0	31.75



Parsons
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CORING LOG

(continued)

BORING NUMBER: **Wayne 3**

SHEET NUMBER: 3 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
35	1:41	R-7 34.8 - 39.8	60	100	100	Same as R-1, strong; no apparent foliation; trace mica; trace medium grained garnet; gray mineral deposit in fracture at 38.4'	I	R4	10	1.5	1.0	31.9
	1:51								10	1.5	1.0	32.05
	1:51								0	1.5	1.0	32.5
	1:37								0	1.5	1.0	33.2
	n/r								0	1.5	1.0	33.6
	1:37								0	1.5	1.0	34.6
	1:28								30	1.5	1.0	35.9
	1:37								5	1.5	1.0	36.7
	1:28								0	1.5	1.0	37.3
	1:35								30	1.5	1.0	37.95
40	1:28	R-8 39.8 - 44.8	60	100	100	Same as R-1, strong; no apparent foliation; green staining in fractures at 40.65' and 42.95'	I	R4	0	1.5	2.0	38.4
	1:35								40	1.5	1.0	40.65
	1:38											
	1:45								40	1.5	1.0	42.95
	1:36											
45	1:42	R-9 44.8 - 49.8	60	100	100	Same as R-1, very strong, wide fracture spacing 44.8-48.4', moderate fracture spacing 48.4-49.1'; no apparent foliation	I	R5	40	1.5	1.0	44.5
	1:48											
	1:48											
	1:46											
	1:43											
50	1:29	R-10 49.8 - 54.8	58	97	97	Same as R-1, very strong, wide fracture spacing 49.8-54.0', moderate fracture spacing 54.0-54.8'; no apparent foliation; trace mica; trace coarse grained garnet; gray clayey sand deposit < 1/16" in fracture at 54.0'	I	R5	0	1.5	1.0	48.4
	n/r								25	1.5	1.0	49.1
	2:10											
	2:03											
	2:12											
55	1:56	R-11 54.8 - 59.8	60	100	98	Same as R-1, very strong, moderate to wide fracture spacing except extremely close fracture spacing 58.85-58.95'; no apparent foliation; trace mica; trace coarse grained garnet; orange and brown staining on and around slightly weathered joint walls at 57.1' and 58.9'; gray mineral deposit in fracture at 58.95'	I	R5	30	1.5	3.0	54
	2:09											
	2:28								5	1.5	2.0	57.1
	2:28											
	2:15											
60	2:12	R-12 59.8 - 64.8	60	100	100	Same as R-1, very strong, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; green staining in fracture at 64.25'	I	R5	0	1.5	1.0	58.85
	2:12								0	1.5	2.0	58.9
	2:10								35	1.5	2.0	58.95
	2:17								0	3	1.0	59.35
	2:18								5	1.5	1.0	61.3
65	2:14	R-13 64.8 - 69.8	60	100	100	Same as R-1, very strong, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; 0.5-1" quartz pockets between 64.8' and 66.8'; white mineral deposit in fracture at 66.0'	I	R5				
	2:30								5	3	1.0	64.25
	2:38								30	1.5	0.75	66
	2:58								10	3	1.0	66.9

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 3**

SHEET NUMBER: 4 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
70	3:03											
	2:25											
	2:29	R-14 69.8 - 74.8	60	100	100	Same as R-1, very strong; no apparent foliation; trace mica; trace coarse grained garnet; 0.25-0.5" quartz pockets throughout and 0.125-0.25" thick veins at approximate 1' spacing; white mineral deposit in fracture at 73.5'	I	R5				
	3:05								0	1.5	1.0	71.75
	2:55								30	1.5	0.75	73.5
75	3:15											
	3:05											
	2:35	R-15 74.8 - 79.8	60	100	100	Same as R-1, very strong, moderate to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; 0.25-0.5" quartz pockets at approximate 6" spacing throughout and 1" thick quartz vein at 78.0'; gray mineral deposit in fracture at 77.0'; green staining and red mineral deposit < 1/16" diameter fracture at 78.05'	I	R5				
	2:20								30	1.5	2.0	77
	2:28								30	3	1.0	77.7
	2:30								30	1.5	2.0	78.05
80	2:21											
	2:21	R-16 79.8 - 84.8	60	100	100	Same as R-1, very strong, wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; quartz pockets, lenses, and veins throughout at approximate 4-6" spacing	I	R5	0	1.5	1.0	79.3
	2:26								45	1.5	2.0	80.15
	2:37								45	1.5	2.0	82.45
	2:35											
85	2:37											
	1:48	R-17 84.8 - 89.8	60	100	100	Same as R-1, very strong, wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; 0.5" quartz pockets throughout at approximate 6" spacing	I	R5	30	1.5	1.0	85.2
	1:43								40	1.5	1.0	87.25
	1:30											
	1:25											
90	1:32											
	1:45	R-18 89.8 - 94.8	60	100	100	Same as R-1, very strong, wide fracture spacing; no apparent foliation; trace mica	I	R5				
	1:40								20	1.5	1.0	92.25
	1:41											
	1:39											
95	1:43											
	1:54	R-19 94.8 - 99.8	60	100	100	Same as R-1, very strong, wide fracture spacing; no apparent foliation; trace mica; 0.5" quartz vein at 96.3'	I	R5	5	1.5	1.0	94.25
	1:52								30	1.5	0.75	96.3
	1:39											
	1:43											
100	1:40											
	* not recorded					Bottom of boring at 99.8'. Coring down pressure and rotations per minute not recorded 8.0-9.8', 300 psi and 350 rpm 9.8-14.8', 400 psi and 450 rpm 14.8-29.8', 500 psi and 450 rpm 29.8-34.8', 400 psi and 450 rpm 34.8-49.8', 400 psi						

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 3**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
105						and 350 rpm 49.8-69.8', 500 psi and 450 rpm 69.8-84.8' and 700 psi and 500 rpm 84.8-99.8'. Cement grouted to top of rock and sealed with bentonite chips upon from top of rock to ground surface upon completion. Pavement restored with asphalt patch.						
110												
115												
120												
125												
130												
135												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **Wayne 4**

SHEET NUMBER: 1 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Bonifant Street east of Fenton Street**

COORD. N: **483,665.3** E: **1,305,726.1**

STN. NO.: OFFSET:



SURFACE ELEV.: **333.6 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/12/07** TIME: **2:00 pm**

FINISH DATE: **3/13/07** TIME: **4:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S	U	P	G	C	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"				2"	4/26/07	10:45 am	17.2	-	99.8
Length		24"				5'	5/2/07	3:55 pm	17.2	-	99.8
Hammer Wt.		140lbs	Drill Rod Size				5/7/07	8:00 am	17.3	-	99.8
Hammer Fall		30"	I.D. (O.D.)				5/10/07	8:05 am	17.2	-	99.8

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)			RQD %
Depth Elev.													
5			S	1		0.0 - 2.0	2	3	3	2	12	0 333.6	Damp, medium stiff, reddish brown, SILT and CLAY, trace mica (CL-ML)
			S	2		2.0 - 4.0	1/18"			1	12	Damp, very soft, reddish brown, Silty CLAY, trace fine Sand, trace mica (CL-ML) Pocket penetrometer: 0.75tsf, pocket torvane 2.0tsf Same as S-2 (CL-ML)	
			S	3		4.0 - 6.0	woh	woh	woh	1	12		
10		S	4	6.0 - 8.0		1	3	4	5	24	6 327.6	Moist, medium stiff, reddish brown, Clayey SILT, trace mica (ML) Same as S-4, stiff (ML)	
		S	5	8.0 - 10.0		3	4	7	8	22			
	15		S	6	13.5 - 15.0	5	5	8		9	13.75 319.85	S-6A (Top 3 inches): Same as S-4 (ML) S-6B (Bottom 6 inches): Damp, medium dense, fine SAND, some Silt, trace mica; relict rock structure (SM)	
20			S	7	18.5 - 18.8	50/4"				4	18.5 315.1	Damp, very dense, gray and brown, fine to coarse SAND and pink angular Gravel, trace mica (SP)	
												22.5 311.1	Auger refusal and coring begun at 22.5'.



Parsons
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Quade &
Douglas, Inc.

CORING LOG

BORING NUMBER: **Wayne 4**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Bonifant Street east of Fenton Street**

COORD. N: **483,665.3** E: **1,305,726.1**

STN. NO.: OFFSET:

SURFACE ELEV.: **333.6 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **3/12/07** TIME: **2:00 pm**

FINISH DATE: **3/13/07** TIME: **4:00 pm**

CORE BARREL DATA:						NOTES:	GROUNDWATER DATA					
							Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)	
TYPE: NX												
CORE SIZE: 2"							4/26/07	10:45 am	17.2	-	99.8	
O.D.: 3"							5/2/07	3:55 pm	17.2	-	99.8	
I.D.: 2"							5/7/07	8:00 am	17.3	-	99.8	
CASING SIZE: " (")							5/10/07	8:05 am	17.2	-	99.8	
DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
25	n/t*	R-1 22.5 - 24.8	17	63	63	Gray, fine to medium grained GNEISS, strong, unweathered, close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz lenses throughout; brown staining and slightly weathered joint walls in fracture at 22.8'	I	R4	45	1.5	2.0	22.8
	1:50	R-2 24.8 - 29.8	58	97	93	Same as R-1, close to wide fracture spacing; no apparent foliation; trace mica; trace coarse grained garnet; 1-2" quartz lenses at approximate 6" spacing; 50° healed fractures between 28.5' and 29.8'; 0.5" thick vein of white, red, and green mineral deposits and red sand deposit < 1/8" at 29.8'; orange staining, 0.5" on either side of fracture at 28.05'; orange stain in fracture at 28.9'	I	R4	5 15 5	1.5 3 1.5	1.0 1.0 2.0	27.85 28.05 28.9
	1:40											
	1:35											
1:29												
30	1:36	R-3 29.8 - 34.8	60	100	100	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 50° healed fractures with white mineral infill < 1/16" between 29.8' and 31.8'; 0.5" thick vein of white, red, and green mineral deposits and red sand deposit < 1/8" at 29.8'; green staining and white mineral deposit in fracture at 31.85'	I	R4	5 0 5	1.5 1.5 1.5	2.0 1.0 1.0	31.85 33.4 34.05
	1:44											
	1:40											
	1:50											
35	1:54	R-4 34.8 - 39.8	60	100	100	Same as R-1, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pockets throughout and 2" quartz lens at 36.9'; green staining and slightly weathered joint walls in fracture at 35.8'; gray mineral deposit in fracture at 37.3'; green staining in fracture at 39.5'	I	R4	40 25	1.5 1.5	2.0 2.0	35.8 37.3
	1:53											
	1:51											
	1:48											
40	1:58	R-5 39.8 - 44.8	60	100	100	Same as R-1, moderate to wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pockets throughout and 1.5" quartz lens at 42.5'; gray mineral deposit in fracture at 40.85'	I	R4	10 45	1.5 1.5	1.0 2.0	39.5 40.85
	1:47											
	1:24											
	1:34											
45	1:50	R-6				Same as R-1; no apparent foliation; trace mica; coarse grained garnet throughout; vari colored clay deposit in fractures at 45.05' and 45.14'; gray mineral deposit in fracture at 47.1'; red clayey sand	I	R4	40 45 5	1.5 3 3	1.0 3.0 1.0	43.7 45.05 45.14 46.4
	1:55											
	2:01											
	1:53											
	2:12											

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/12/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 4**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
50	1:51	44.8 - 49.8	57	95	82	deposit in fracture at 47.25'; red discoloration and green mineral deposit < 1/16" in fracture at 47.75'; red staining and gray sand deposit < 1/8" in fracture at 48.0'	I	R4	50	1.5	2.0	47.1
	1:52								50	3	3.0	47.25
	1:45								60	3	2.0	47.75
	2:02								10	1.5	2.0	48
55	1:43	R-7 49.8 - 54.8	60	100	85	Same as R-1; no apparent foliation; trace mica; coarse grained garnet 49.8-54.8'; high angle healed fractures throughout with white and red mineral deposits; gray staining in fractures at 50.6' and 52.2'; gray staining and slightly weathered joint walls in fracture at 52.9'; red staining in fractures at 53.05' and 53.2'; sand deposit < 1/16" and slightly weathered joint walls in fracture at 53.55'; gray sand deposit < 1/16" in fracture at 54.15'	I	R4	45	1.5	1.0	50.6
	1:51								45	1.5	1.0	52.2
	1:58								60	1.5	2.0	52.9
	1:19								50	1.5	1.0	53.05
60	2:50/2ft	R-8 54.8 - 59.8	60	100	100	Same as R-1, close to wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 75-85° healed fractures throughout with white and red mineral deposits; green staining in fractures at 57.35' and 58.1'; sandy clay fill < 0.5" and slightly weathered joint walls in fracture at 58.5'	I	R4	50	1.5	1.0	53.2
	2:41/2ft								5	3	2.0	53.55
	1:34								5	1.5	2.0	54.15
	1:32								15	1.5	1.0	57.35
65	1:27	R-9 59.8 - 64.8	60	100	97	Same as R-1; no apparent foliation; trace mica; coarse grained garnet throughout; quartz pockets throughout; gray clay deposit < 1/16" and slightly weathered joint walls in fracture at 62.3'; white staining, red mineral deposit, and slightly weathered joint walls in fracture at 62.8'	I	R4	5	1.5	1.0	58.1
	1:26								30	1.0	5.0	58.5
	1:26								5	1.5	1.0	61.5
	1:29								0	3	3.0	62.3
70	2:37/2ft	R-10 64.8 - 69.8	60	100	85	Same as R-1, fine to coarse grained, very close to moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; rock pieces with slick sides and vari colored staining between 64.8' and 65.1'; vari colored staining in fracture at 65.1' and on slightly weathered joint walls at 66.55'; gray mineral deposit in fracture at 66.7'; gray staining in fractures at 67.05' and 68.0'	I	R4	0	3	2.0	62.8
	1:33								50	1.5	2.0	65.1
	1:24								40	3	2.0	66.55
	1:42								15	1.5	1.0	66.7
75	1:51	R-11 69.8 - 74.8	60	100	100	Same as R-1, fine to coarse grained, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; green staining and slightly weathered joint walls in fractures at 70.5' and 71.6'	I	R4	5	1.5	1.0	67.05
	1:43								5	1.5	1.0	68
	2:04								10	1.5	1.0	68.75
	2:18								0	1.5	1.0	70.5
80	2:01	R-12 74.8 - 79.8	60	100	98	Same as R-1, very close to close fracture spacing 74.8-75.45', moderate fracture spacing 75.45-79.8'; no apparent foliation; trace mica; coarse grained garnet throughout; green staining in fractures at 75.35', 75.45', 77.0', and on slightly altered joint walls at 77.8'	I	R4	0	1.5	1.0	71.6
	1:48								0	1.5	1.0	72.05
	1:42								0	1.5	1.0	72.95
	1:35								0	1.5	1.0	75.35
85	1:32	R-13				Same as R-1; no apparent foliation; trace mica; coarse grained (< 0.25" diameter) garnet throughout; 85° healed fracture with white mineral infill between 81.8' and 83.4'	I	R4	0	1.5	1.0	75.45
	1:40								0	1.5	1.0	77
	1:50								70	3	2.0	77.8
	1:52								10	1.5	1.0	79.3



Parsons
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Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 4**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
85	1:35	79.8 - 84.8	60	100	100	Same as R-1, very strong, moderate fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; gray mineral deposit < 1/16" in fracture at 87.8'	I	R5	0 45	1.5 1.5	1.0 2.0	87 87.8
	1:36											
	1:43											
	1:44											
	2:02											
90	1:55	84.8 - 89.8	57	95	95	Same as R-1, very strong, wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; quartz throughout including 2" lens at 90.8' and 3" lens at 92.6'	I	R5				
	1:59											
	1:51											
	2:14											
	2:09											
95	1:54	89.8 - 94.8	60	100	100	Same as R-1, very strong, moderate to wide fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; green staining in fracture at 96.0'	I	R5				
	2:14											
	2:06											
	2:08											
	2:18											
100	* not recorded	94.8 - 99.8	60	100	100	Bottom of boring at 99.8'. Coring down pressure and rotations per minute not recorded 22.4-34.8'. Coring down pressure 450 psi and 450 rpm 34.8-89.8'. Well installed with 10' screen 87'-97' and sealed with bentonite chips upon completion. See separate appendix for well installation log. Boring drilled in grass area between street and county parking lot. Site restored with seed and straw.						
105												
110												
115												

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/13/07

BORING LOG

BORING NUMBER: Wayne 5

SHEET NUMBER: 1 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Silver Spring, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: E. Hill

INSPECTOR: C. Nicholson

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: Ford F700 truck mounted CME 55 with automatic hammer

LOCATION: Cedar St at Wayne Ave

COORD. N: 484,498.7 E: 1,306,154.4






STN. NO.: OFFSET:

SURFACE ELEV.: 323.9 feet

DATUM: **NAD 83/91 and NAVD 88**

START DATE: 4/18/07 TIME: 2:00 pm

FINISH DATE: 4/20/07 TIME: 9:15 am

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Piston	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
		1.375"				2"					
		2"				3"	4/20/07	8:00 am	9.8	10.7	80.0
		24"				5'					
		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

[illegible]



Parsons
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CORING LOG

BORING NUMBER: **Wayne 5**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow Stem Auger**

RIG TYPE: **Ford F700 truck mounted CME 55 with automatic hammer**

LOCATION: **Cedar St at Wayne Ave**

COORD. N: **484,498.7** E: **1,306,154.4**

STN. NO.: OFFSET:

SURFACE ELEV.: **323.9 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **4/18/07** TIME: **2:00 pm**

FINISH DATE: **4/20/07** TIME: **9:15 am**

CORE BARREL DATA:

NOTES:

TYPE: **NX**

CORE SIZE: **2"**

O.D.: **3"**

I.D.: **2"**

CASING SIZE: **" (")**

GROUNDWATER DATA

Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
4/20/07	8:00 am	9.8	10.7	80.0

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
15	1:57	R1 10.7 - 15.0	36	69	46	Very fast drilling 10.7-12.0' that possibly encountered soft material washed out by core water. Gray and brown, fine to medium grained GNEISS, weak to medium strong, slightly weathered, very close fracture spacing; swirly bedding 12.95-15.0'; trace mica including 1.5" lens at 13.4'; 1" quartz pockets at 13.6' and 14.4'; nearly vertical healed fractures throughout; orange and black staining in fractures at 12.55', 13.2', and 14.5'	II	R3/R2				
	1:52								50	3	2.0	12.55
	2:30								10	3	1.0	12.9
	2:02	R2 15.0 - 20.0	60	100	83		I/II	R3	0	1.5	1.0	13
	2:21								0	3	2.0	13.2
2:22	10					1.5			2.0	14.5		
2:16	85					3	1.0	15.3				
2:27	0					3	2.0	15.6				
20	1:53	R3 20.0 - 25.0	60	100	100	Gray, fine to medium grained GNEISS, medium strong, slightly weathered 15.0-15.75', unweathered 15.75-20.0', very close fracture spacing 15.0-17.0', close fracture spacing 17.0-20.0'; swirly bedding 16.0-20.0'; trace mica; 0.5" quartz pockets throughout and 1.5" quartz pocket at 17.8'; nearly vertical healed fractures throughout; orange and black staining in fractures at 15.3', 16.1', 16.95', and 19.4'; brown sand deposit < 1/8" in fractures at 15.75', 16.55', and 18.5'	I	R3	60	3	2.0	15.75
	1:40								30	1.5	1.0	16.1
	1:35								0	1.5	2.0	16.55
	1:57								25	1.5	1.0	16.95
	1:42								50	1.5	2.0	18.5
25	1:12	R4 25.0 - 30.0	50	83	63	Gray, fine to medium grained GNEISS, medium strong, unweathered, close fracture spacing; swirly bedding throughout; medium grained garnet throughout; 0.5" quartz pockets throughout; 65° to nearly vertical healed fractures throughout; orange and black staining in fracture at 20.8'; orange discoloration 2" on either side of fracture at 23.15'	I/II	R4	35	1.5	1.0	19.4
	2:40								20	1.5	1.0	20.8
	3:12								20	3	1.0	21.45
	2:42								50	1.5	1.0	23.15
	1:53											
30	3:03	R5 30.0 - 35.0	60	100	77	Based on coring rates, weathering and condition of recovery at top of run, assume recovery represents 25.8-30.0'. Gray, fine to medium grained GNEISS, strong, slightly weathered 25.0-26.5', unweathered 26.5-30.0', close fracture spacing; faint swirly bedding throughout; trace mica 26.3-28.8'; medium to coarse grained garnet throughout; 2" vein of quartz broken with additional subangular rock pieces between 25.0' and 26.3'	I	R3	90	3	1.0	26.5
	2:10								60	3	1.0	27.6
	2:17								5	1.5	1.0	27.9
	2:15								30	1.5	1.0	28.2
	n/r*								30	1.5	1.0	29.4
35						Gray, fine to medium grained GNEISS, medium strong, unweathered, close fracture spacing; swirly bedding 30.0-31.6'; lens of coarse mica grains and garnet between 30.5' and 30.8'; orange staining in	I	R4	50	1.5	1.0	30.6
		0	1.5	2.0	31.65							
		85	3	1.0	33.25							

PURPLE LINE CORING LOG PURPLE LINE SILVER SPRING DRAFT GINT LOGS.GPJ MAINLIB.GLB 8/5/07



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 5**

SHEET NUMBER: 3 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
40	4:00/2ft					fractures at 30.6', 31.65', 33.25', 33.9', and 34.8'; slightly weathered joint walls with 0.25" fissiles at 31.65'			5	1.5	1.0	34.8
	2:07	R6 35.0 - 40.0	60	100	100				0	1.5	1.0	37.1
	2:06					Gray, fine to medium grained GNEISS, strong, unweathered, moderate fracture spacing; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; 1" quartz pockets at 37.6', 38.0', 38.3', and 38.9'; 65° healed fracture at 38.4'			45	1.5	1.0	38
	2:09								10	1.5	1.0	39.1
	2:02						I	R4	30	1.5	2.0	40.45
45	1:48					Same as R-6, close joint spacing; faint swirly bedding 40.0-41.4'; coarse grained garnet throughout; black mineral deposit < 1/8" diameter in fracture at 40.45'; orange staining in fracture at 40.7'; orange sandy silty clay deposit < 1/16" in fractures at 41.4' and 41.8'; white silty clay deposit < 1/16" in fractures at 41.65' and 41.85'			25	3	1.0	40.7
	1:38	R7 40.0 - 45.0	58	97	83				70	1.5	3.0	41.4
	1:35								5	1.5	3.0	41.65
	1:27								60	1.5	3.0	41.8
	1:27								10	1.5	3.0	41.85
50	1:47					Gray, fine to medium grained GNEISS, very strong, unweathered, wide fracture spacing; faint swirly bedding throughout; trace mica; trace medium grained garnet	I	R5	10	1.5	1.0	44.4
	1:42	R8 45.0 - 50.0	60	100	100				50	1.5	1.0	44.6
	1:50								10	1.5	1.0	47.95
	1:56											
	4:14/2ft					Same as R-8; no apparent foliation; trace mica; coarse grained garnet throughout; quartz lens 54.8-55.0'	I	R5				
55	2:06	R9 50.0 - 55.0	60	100	100							
	2:12											
	2:06								40	1.5	1.0	54.5
	n/r					Same as R-8; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; quartz pockets throughout including 1" at 55.25' and 58.9'	I	R5				
	2:34											
60	2:43	R10 55.0 - 60.0	59	98	98							
	2:21											
	2:12											
	1:53					Same as R-8, close fracture spacing; no apparent foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pockets and lenses throughout and 2" quartz pocket at 62.0'; orange discoloration in and 0.25" around fracture at 60.65'; brown staining in fracture at 62.7'; orange discoloration 0.5" around and brown silty sandy clay deposit < 1/16" in fracture at 62.8'; orange and white silty sandy clay infill < 0.25" in fracture at 63.3'	I	R5	5	1.5	1.0	60.6
	1:40								10	3	1.0	60.65
65	1:37	R11 60.0 - 65.0	60	100	92				20	1.5	1.0	62.7
	1:33								10	3	3.0	62.8
	1:43								60	1.0	6.0	63.3
	2:02					Same as R-8; no apparent foliation; trace mica; coarse grained garnet throughout; 1" quartz pocket at 65.8'	I	R5				
	2:08											
70	2:29	R12 65.0 - 70.0	60	100	95				10	1.5	1.0	67.7
	2:15											
	2:29					Same as R-8, wide fracture spacing; no apparent	I	R5	10	1.5	1.0	69.75



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

CORING LOG

(continued)

BORING NUMBER: **Wayne 5**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Silver Spring, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **E. Hill**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	CORING RATE (min/ft)	CORE RUN NO. AND DEPTH (ft)	RECOVERY (in)	RECOVERY (%)	RQD (%)	DESCRIPTION AND REMARKS (Lithology, Structure, Weathering, Continuity, Strength, Color, Grain Size)	WEATHERING	STRENGTH	DISCONTINUITY DATA			
									ANGLE (deg)	Jr	Ja	DEPTH (feet)
75	2:11	R13 70.0 - 75.0	60	100	100	foliation; trace mica; coarse grained garnet throughout; 0.5" quartz pockets 72.5-72.9' and 1" pocket at 72.75'; 1" lens with 1/8" thick white mineral deposit surrounded by green mineral deposit < 1/8" thick at 74.25'	I	R5	20	1.5	1.0	71.65
	2:00											
	1:58											
	1:50											
	1:53											
80	2:03	R14 75.0 - 80.0	59	98	98	Same as R-8; no apparent foliation; 1" quartz pocket at 75.8'	I	R5	60	1.5	1.0	78.8
	1:59											
	1:55											
	2:04											
	2:07											
85	2:33	R15 80.0 - 85.0	60	100	100	Same as R-8, moderate joint spacing; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; 1" quartz pockets at 80.4' and 81.4'	I	R5	45	1.5	1.0	79.3
	2:30											
	2:30											
	2:12											
	2:07											
90	2:01	R16 85.0 - 90.0	60	100	100	Same as R-8; faint swirly bedding throughout; trace mica; coarse grained garnet throughout; 1" quartz pockets at 85.8' and 89.8'; gray sandy clay deposit < 1/16" in fracture at 89.6'	I	R5	30	1.5	1.0	83.1
	1:41											
	2:02											
	1:40											
	1:43											
90	* not recorded					Bottom of boring at 90'. Coring down pressure and rotations per minute not recorded 10.7-15.0', 300 psi and 400 rpm 15.0-25.0', varied 25.0-30.0' while water supply adjusted, 300 psi and 400 rpm 30.0-35.0', 500 psi and 400 rpm 35.0-60.0', and 600 psi and 500 rpm 60.0-90.0'. Cement grouted to top of rock and sealed with bentonite chips from top of rock to ground surface upon completion. Pavement restored with asphalt patch.			70	1.5	3.0	89.6
95												
100												
105												



Appendix L

Silver Spring Rock Core Photographs

Manchester 1



Manchester 1 from 50.5 ft to 70.0 ft in box 1 of 2 (Shown dry and wet)



Manchester 1 from 70.0 ft to 90.0 ft in box 2 of 2 (Shown dry and wet)

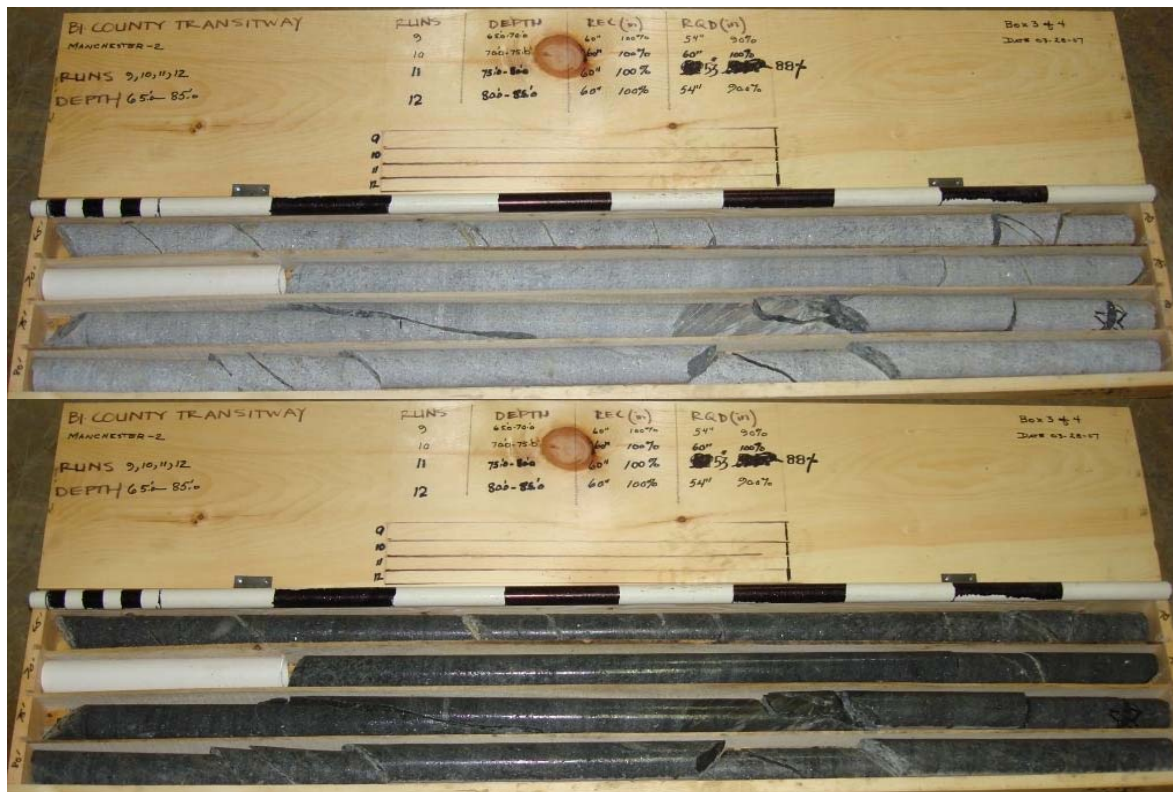
Manchester 2



Manchester 2 from 25.5 ft to 45.0 ft in box 1 of 4 (Shown dry and wet)



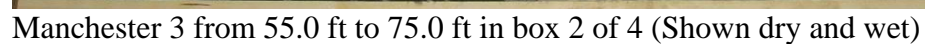
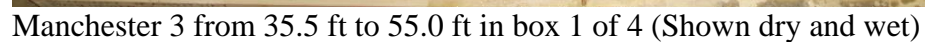
Manchester 2 from 45.0 ft to 65.0 ft in box 2 of 4 (Shown dry and wet)



Manchester 2 from 65.0 ft to 85.0 ft in box 3 of 4 (Shown dry and wet)

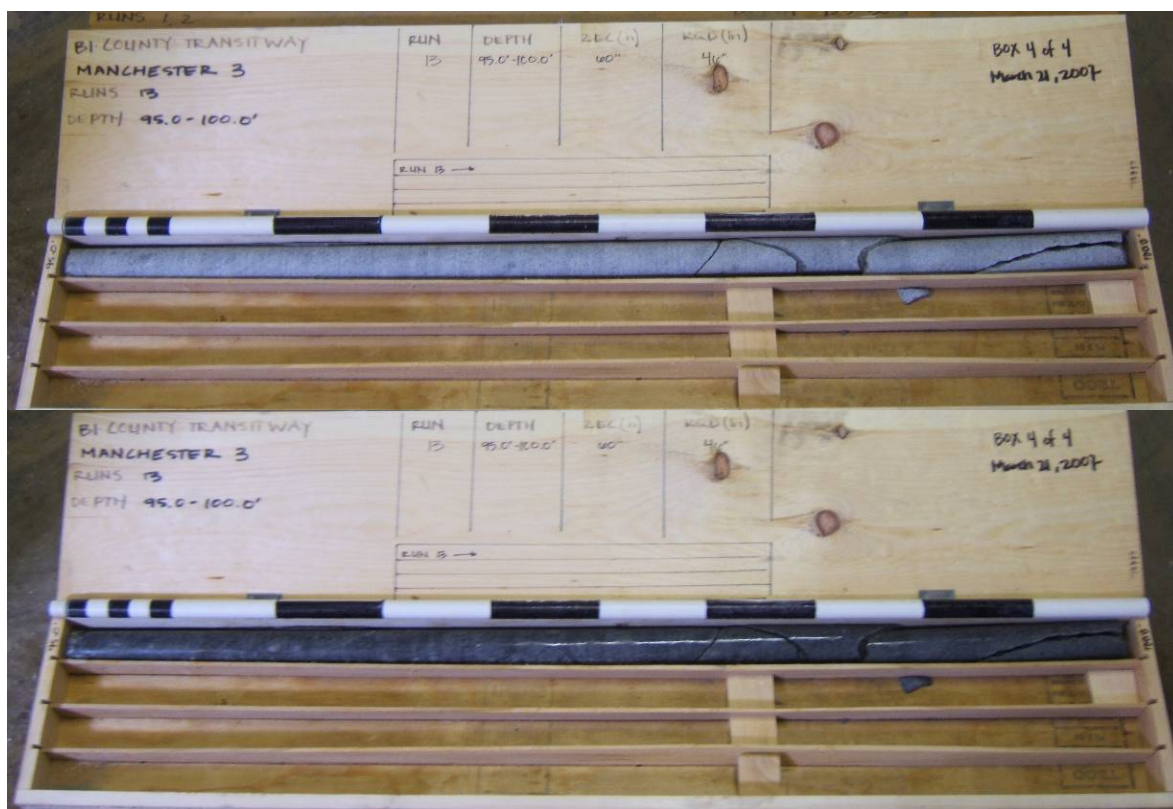


Manchester 2 from 85.0 ft to 90.0 ft in box 4 of 4 (Shown dry and wet)



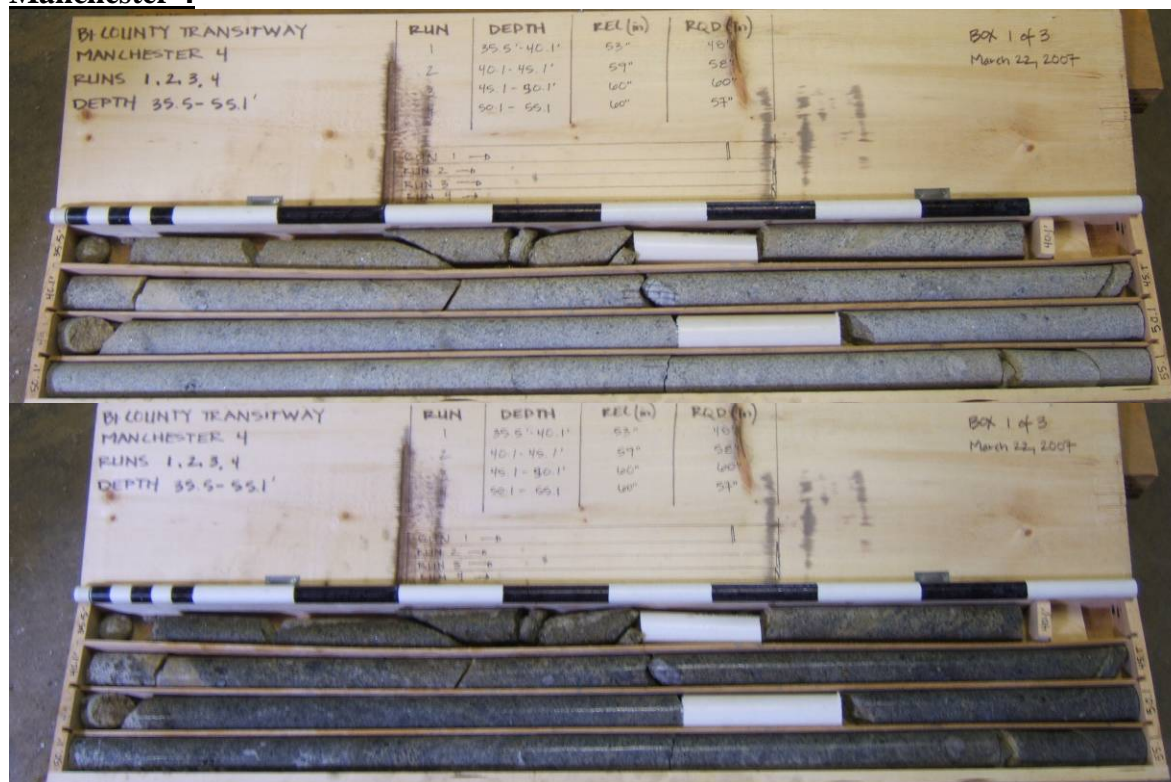


Manchester 3 from 75.0 ft to 95.0 ft in box 3 of 4 (Shown dry and wet)

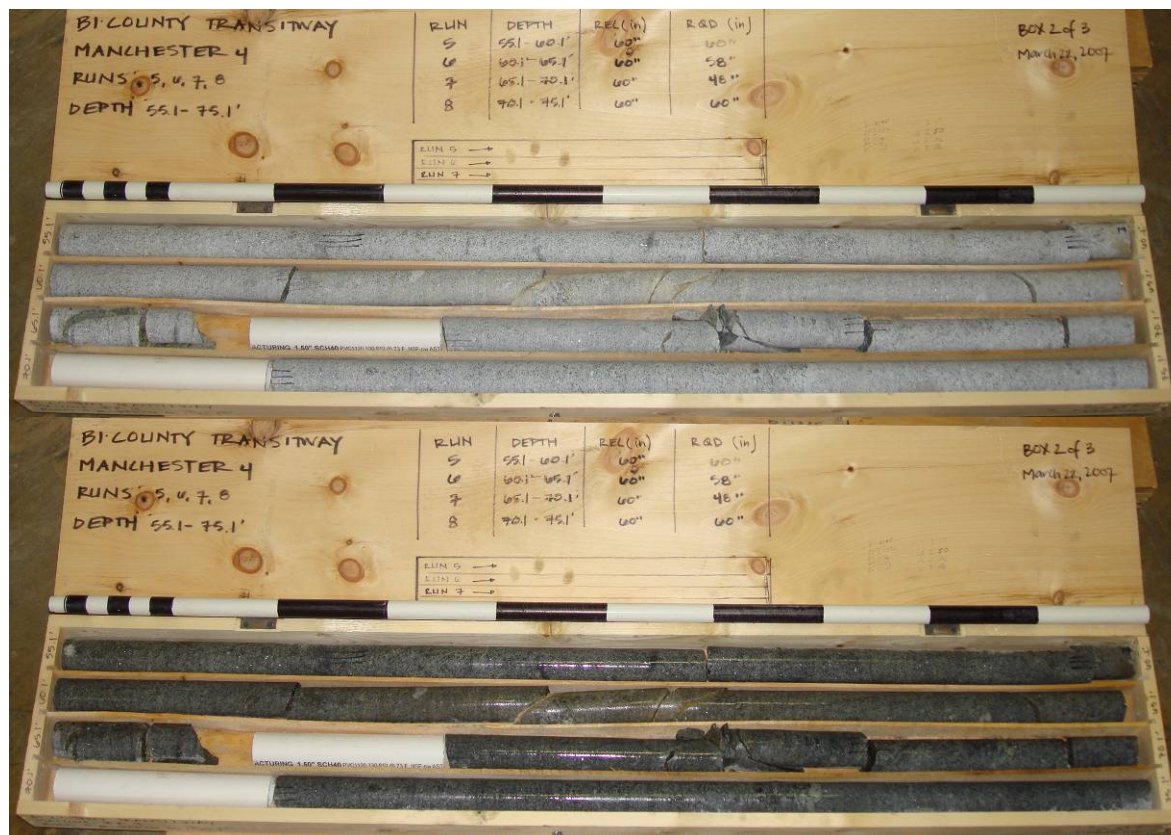


Manchester 3 from 95.0 ft to 100.0 ft in box 4 of 4 (Shown dry and wet)

Manchester 4



Manchester 4 from 35.5 ft to 55.1 ft in box 1 of 3 (Shown dry and wet)



Manchester 4 from 55.1 ft to 75.1 ft in box 2 of 3 (Shown dry and wet)



Manchester 4 from 75.1 ft to 90.1 ft in box 3 of 3 (Shown dry and wet)

Piney 2



Piney 2 from 9.7 ft to 29.7 ft in box 1 of 2 (Shown dry and wet)



Piney 2 from 29.7 ft to 49.7 ft in box 2 of 2 (Shown dry and wet)

Plymouth 1



Plymouth 1 from 45.6 ft to 65.0 ft in box 1 of 3 (Shown dry and wet)



Plymouth 1 from 65.0 ft to 85.0 ft in box 2 of 3 (Shown dry and wet)



Plymouth 1 from 85.0 ft to 100.0 ft in box 3 of 3 (Shown dry and wet)

Plymouth 2



Plymouth 2 from 45.5 ft to 65.0 ft in box 1 of 3 (Shown dry and wet)

Purple Line
Silver Spring, Maryland
Rock Core Photographs

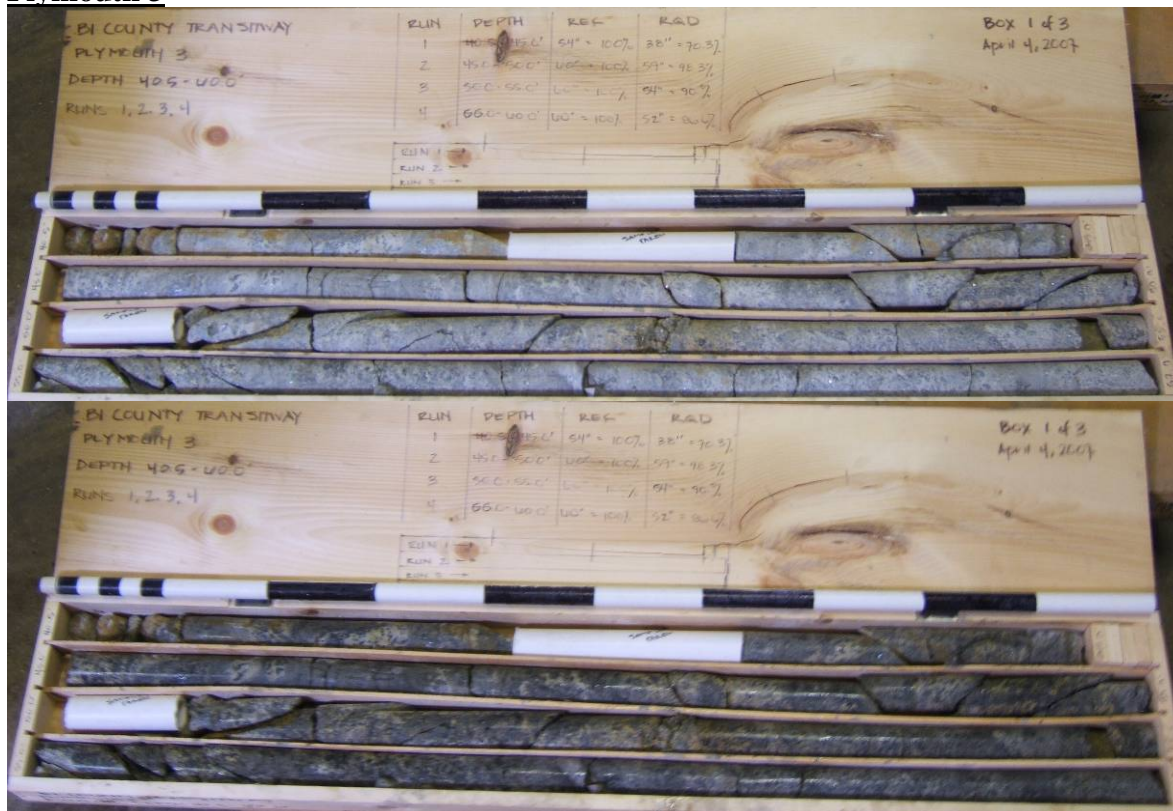


Plymouth 2 from 65.0 ft to 85.0 ft in box 2 of 3 (Shown dry and wet)

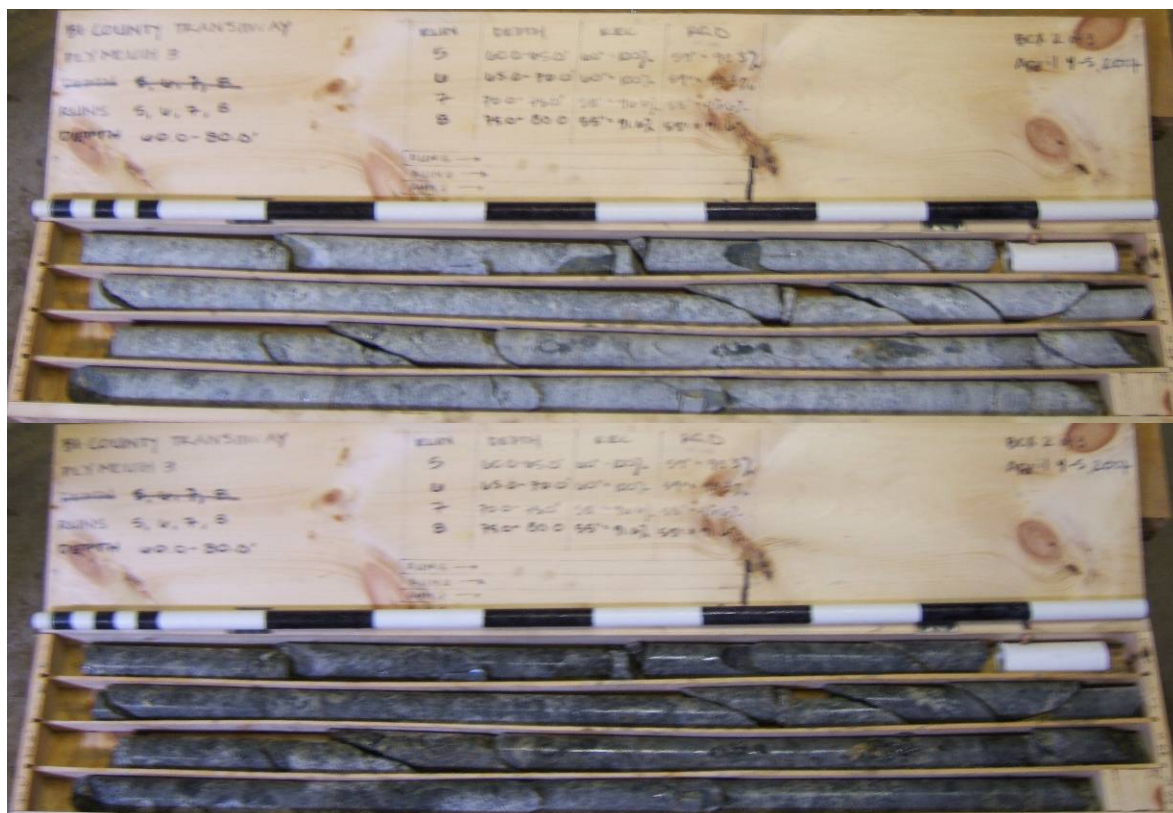


Plymouth 2 from 85.0 ft to 100.0 ft in box 3 of 3 (Shown dry and wet)

Plymouth 3



Plymouth 3 from 40.5 ft to 60.0 ft in box 1 of 3 (Shown dry and wet)



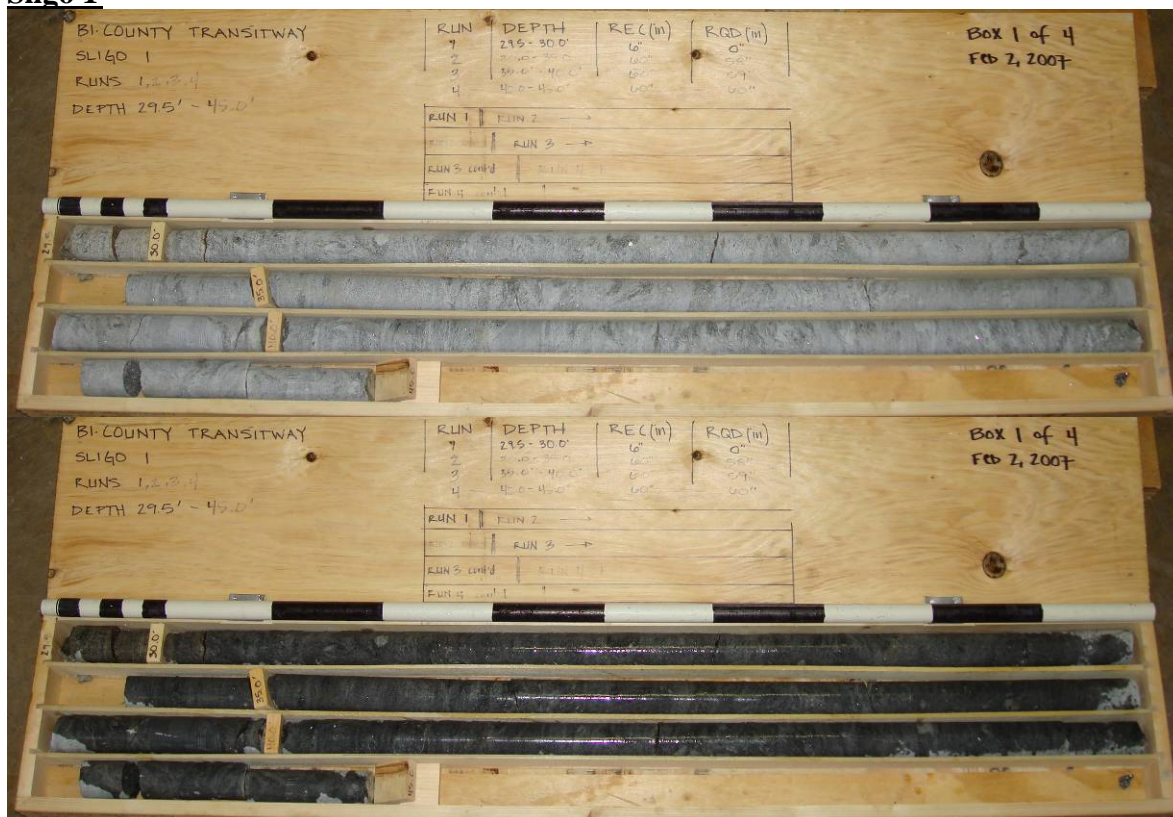
Plymouth 3 from 60.0 ft to 80.0 ft in box 2 of 3 (Shown dry and wet)

Purple Line
Silver Spring, Maryland
Rock Core Photographs



Plymouth 3 from 80.0 ft to 90.0 ft in box 3 of 3 (Shown dry and wet)

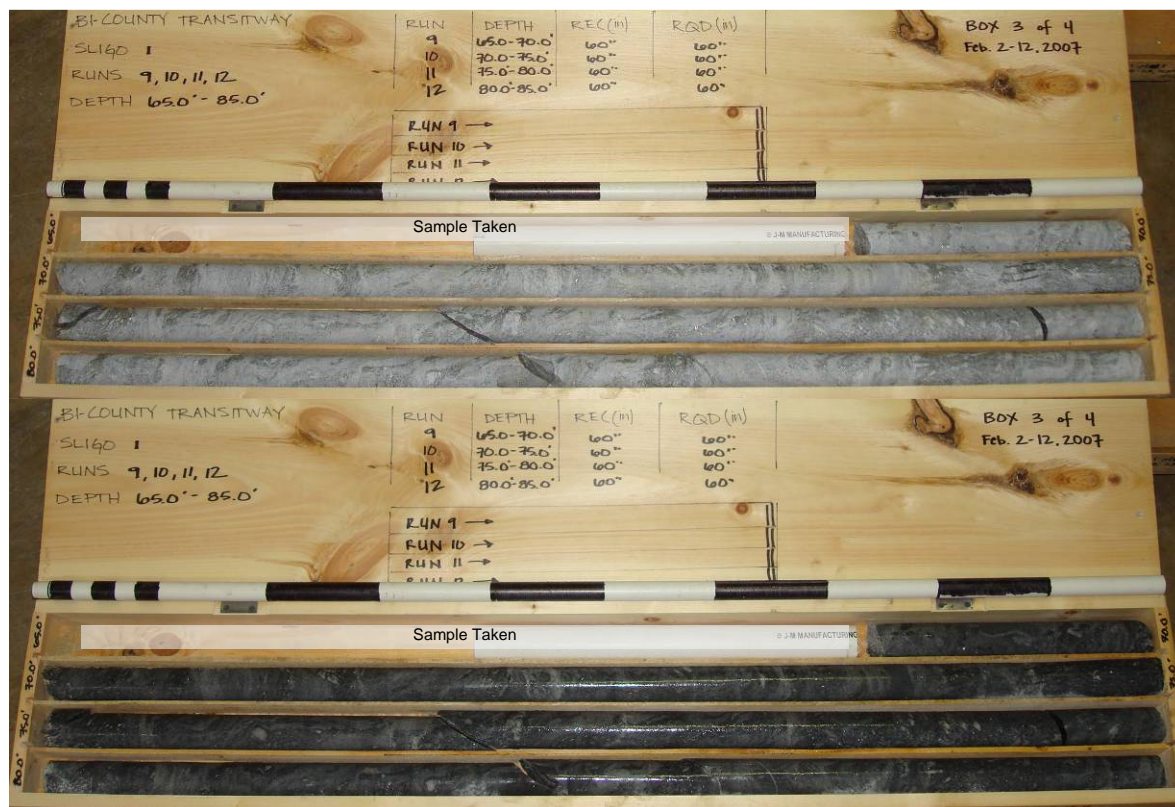
Sligo 1



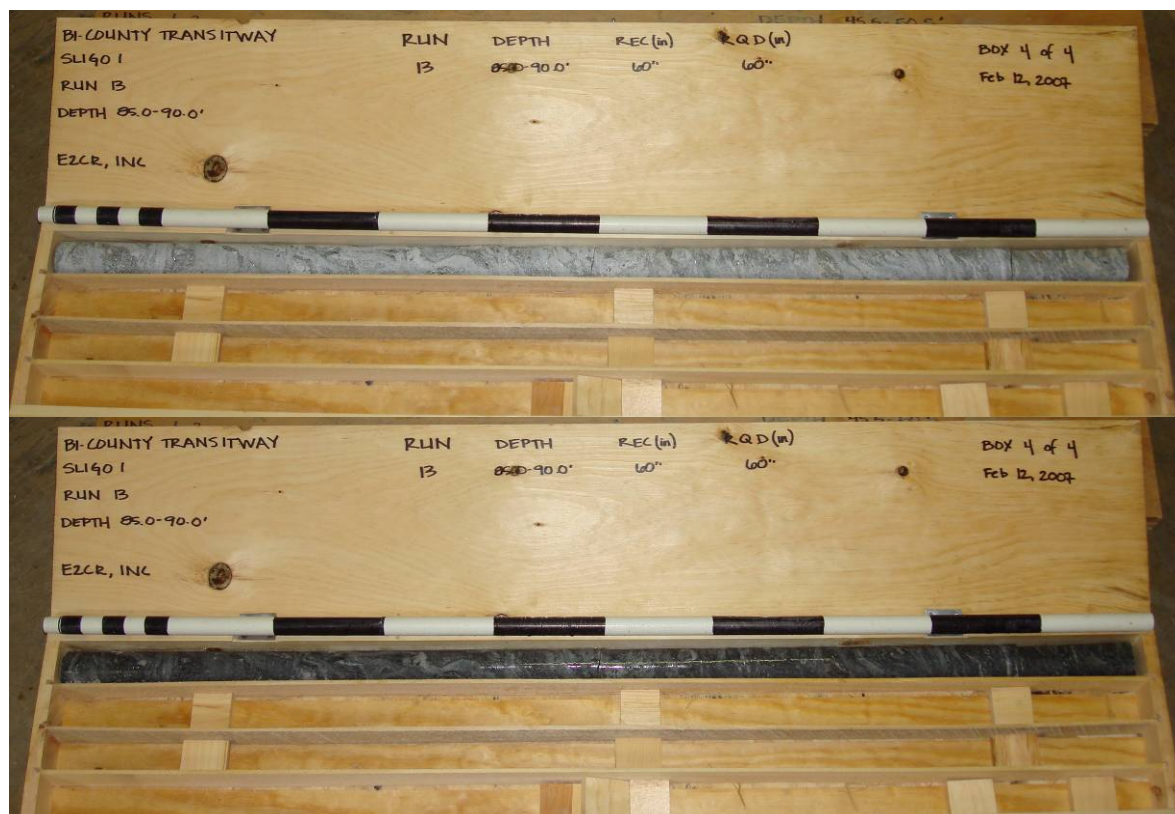
Sligo 1 from 29.5 ft to 45.0 ft in box 1 of 4 (Shown dry and wet)



Sligo 1 from 45.0 ft to 65.0 ft in box 2 of 4 (Shown dry and wet)



Sligo 1 from 65.0 ft to 85.0 ft in box 3 of 4 (Shown dry and wet)

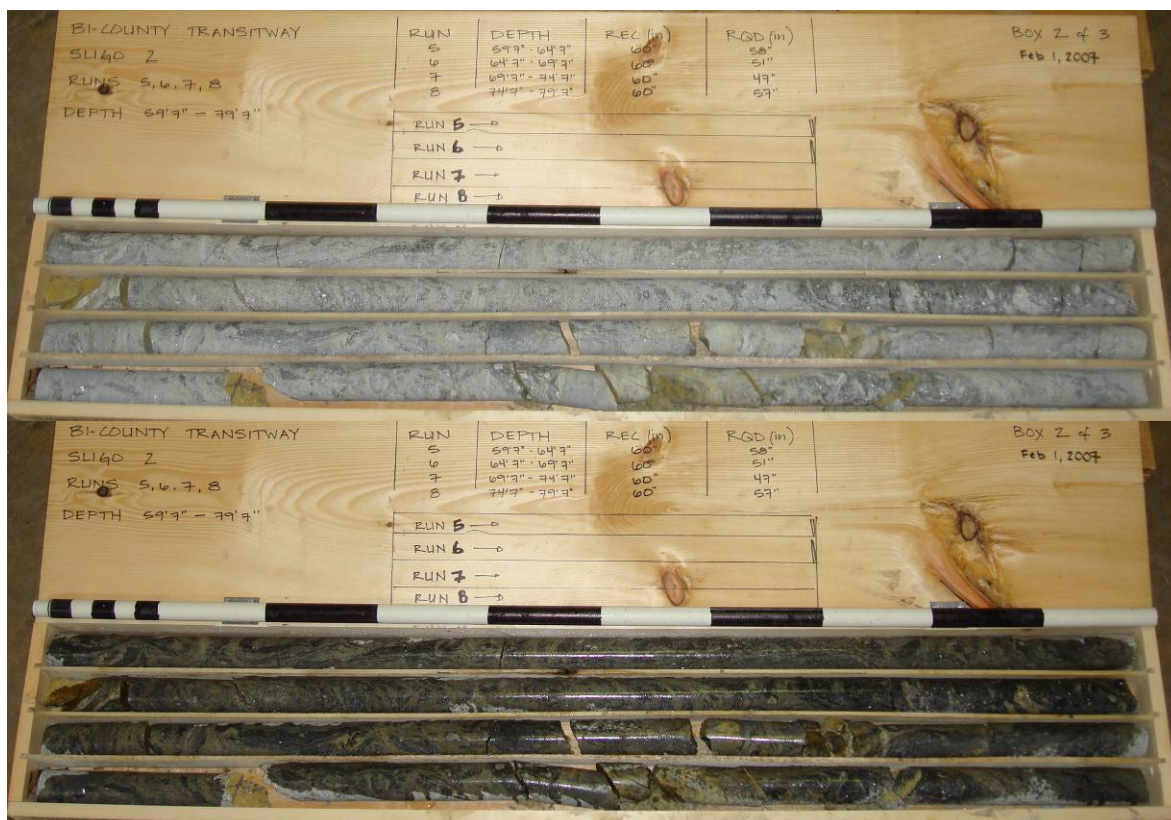


Sligo 1 from 85.0 ft to 90.0 ft in box 4 of 4 (Shown dry and wet)

Sligo 2



Sligo 2 from 40.9 ft to 59.6 ft in box 1 of 3 (Shown dry and wet)



Sligo 2 from 59.6 ft to 79.6 ft in box 2 of 3 (Shown dry and wet)



Sligo 2 from 79.6 ft to 89.6 ft in box 3 of 3 (Shown dry and wet)

Sligo 3



Sligo 3 from 55.0 ft to 75.0 ft in box 1 of 2 (Shown dry and wet)

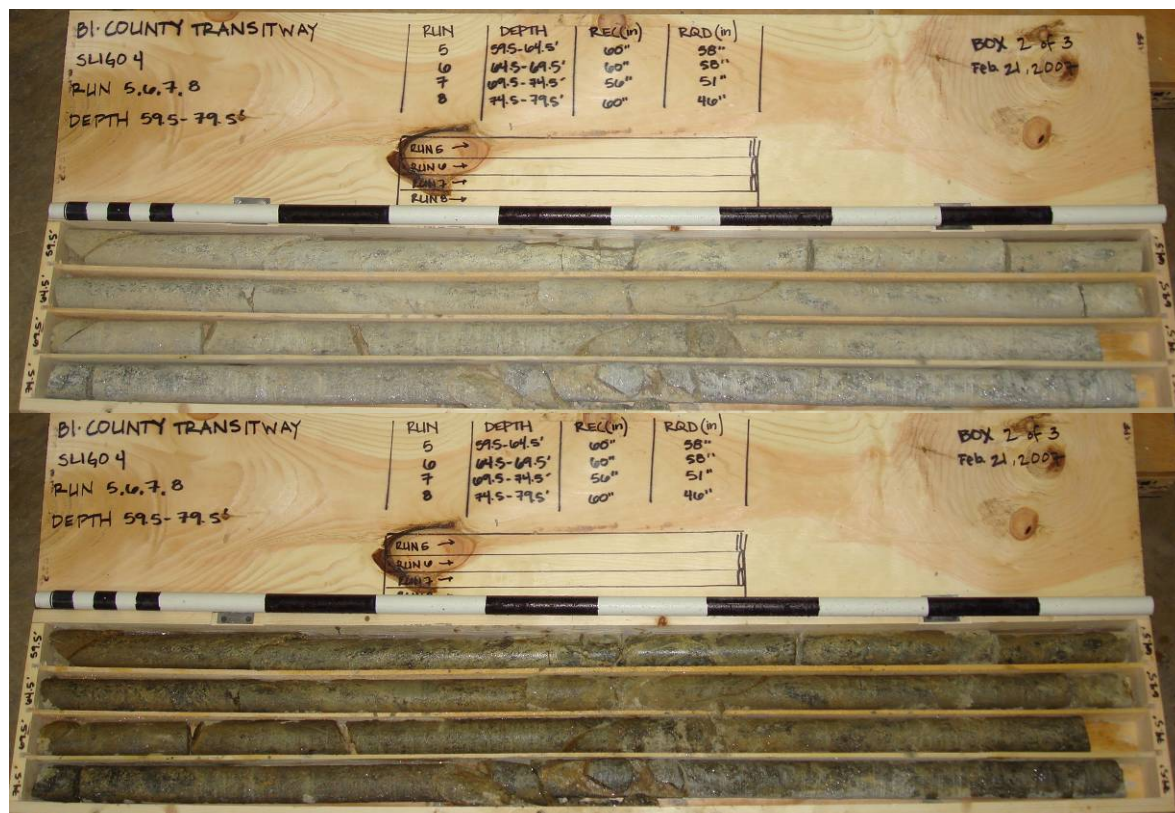


Sligo 3 from 75.0 ft to 90.0 ft in box 2 of 2 (Shown dry and wet)

Sligo 4



Sligo 4 from 40.5 ft to 59.5 ft in box 1 of 3 (Shown dry and wet)



Sligo 4 from 59.5 ft to 79.5 ft in box 2 of 3 (Shown dry and wet)

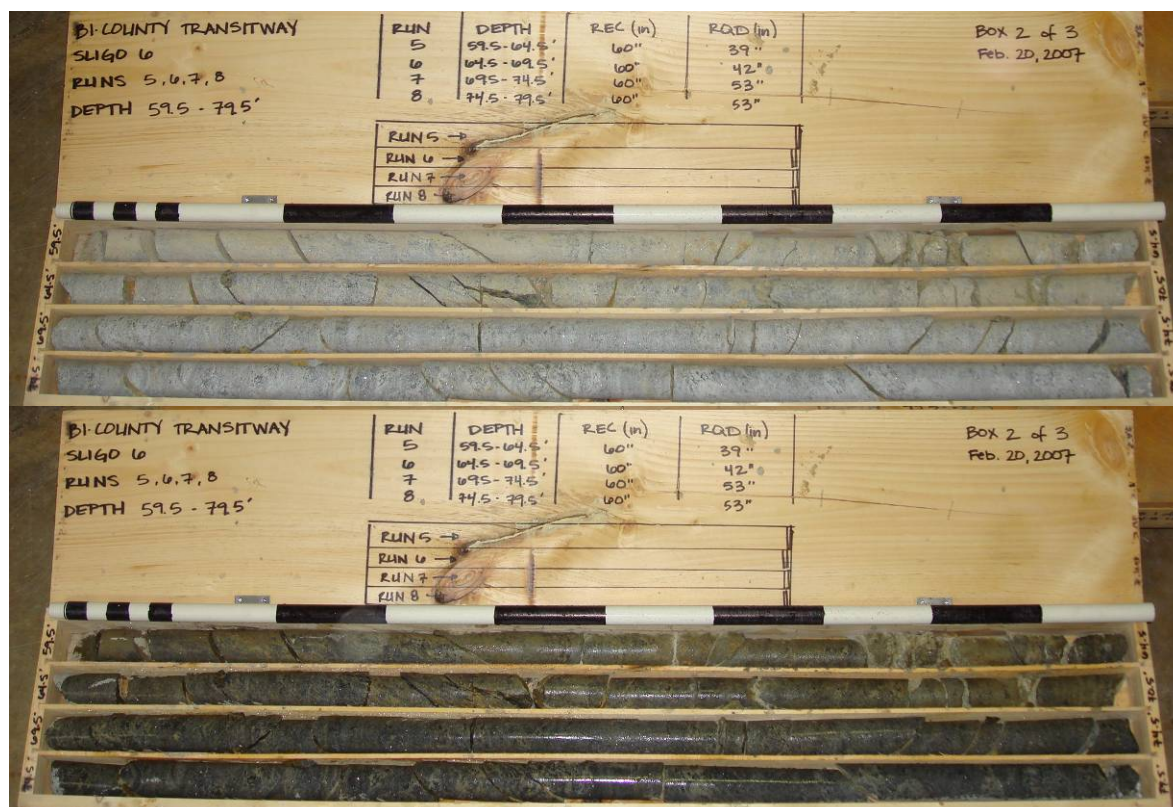


Sligo 4 from 79.5 ft to 89.5 ft in box 3 of 3 (Shown dry and wet)

Sligo 6



Sligo 6 from 40.5 ft to 59.5 ft in box 1 of 3 (Shown dry and wet)



Sligo 6 from 59.5 ft to 79.5 ft in box 2 of 3 (Shown dry and wet)



Sligo 6 from 79.5 ft to 89.5 ft in box 3 of 3 (Shown dry and wet)

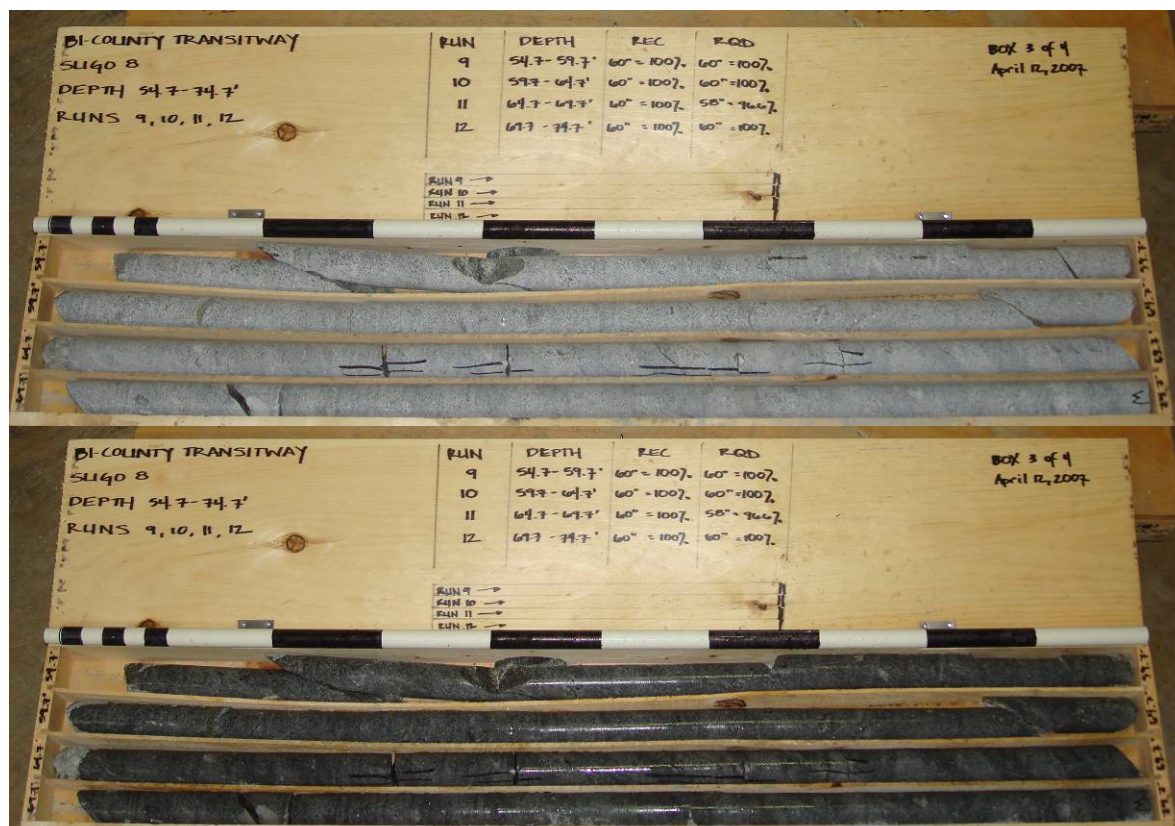
Sligo 8



Sligo 8 from 14.7 ft to 34.7 ft in box 1 of 4 (Shown dry and wet)



Sligo 8 from 34.7 ft to 54.7 ft in box 2 of 4 (Shown dry and wet)

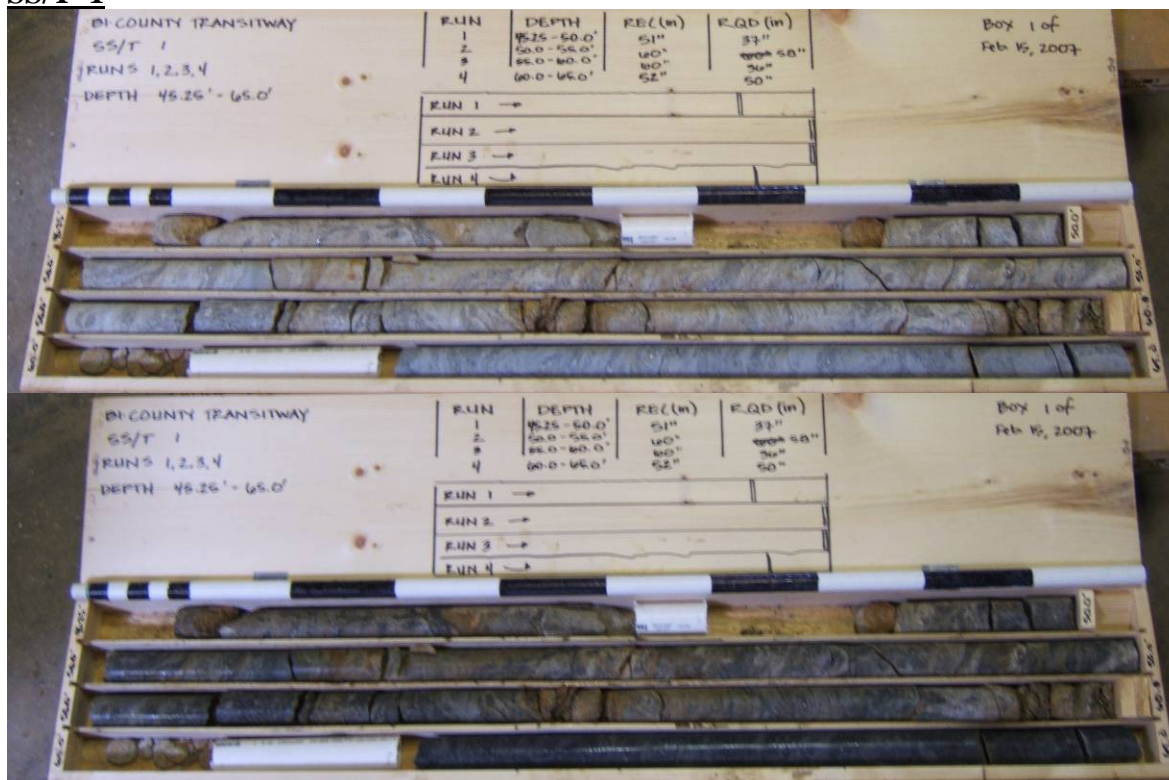


Sligo 8 from 54.7 ft to 74.7 ft in box 3 of 4 (Shown dry and wet)

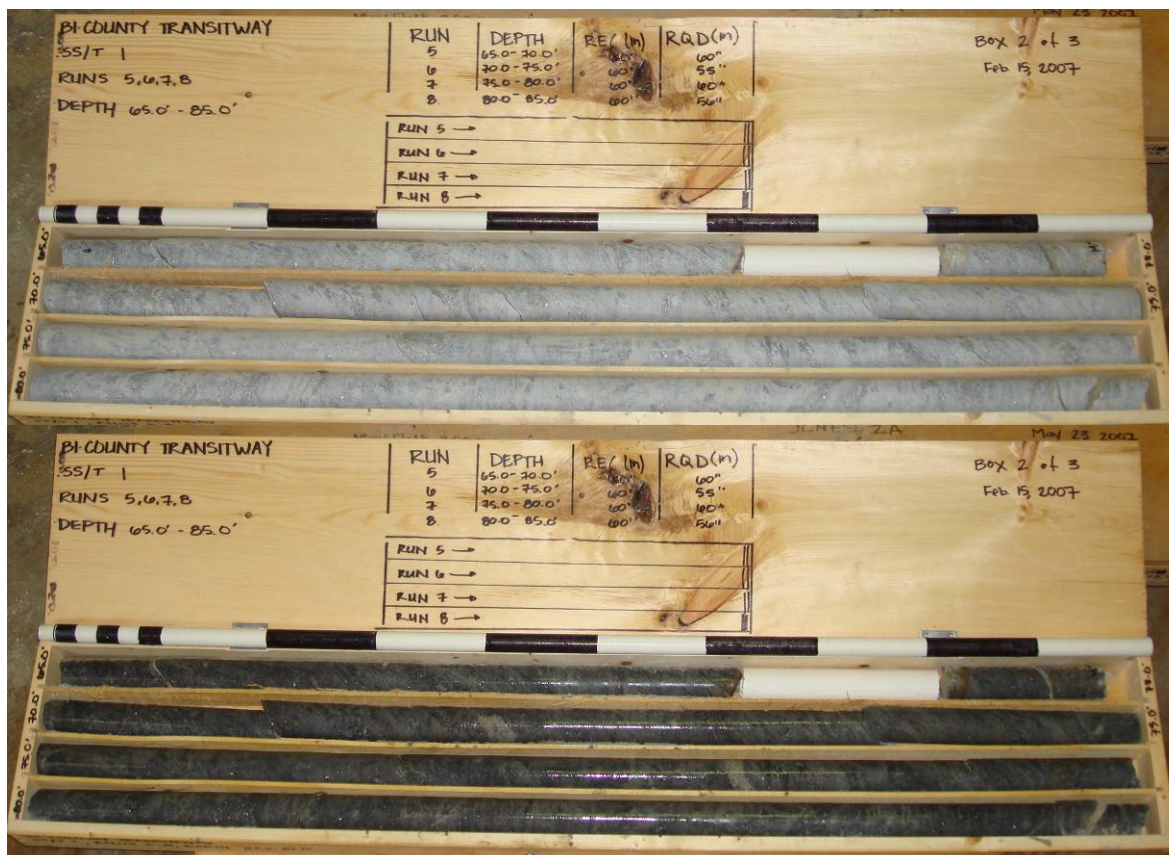


Sligo 8 from 74.7 ft to 89.7 ft in box 4 of 4 (Shown dry and wet)

SS/T 1



SS/T 1 from 45.25 ft to 65.0 ft in box 1 of 3 (Shown dry and wet)

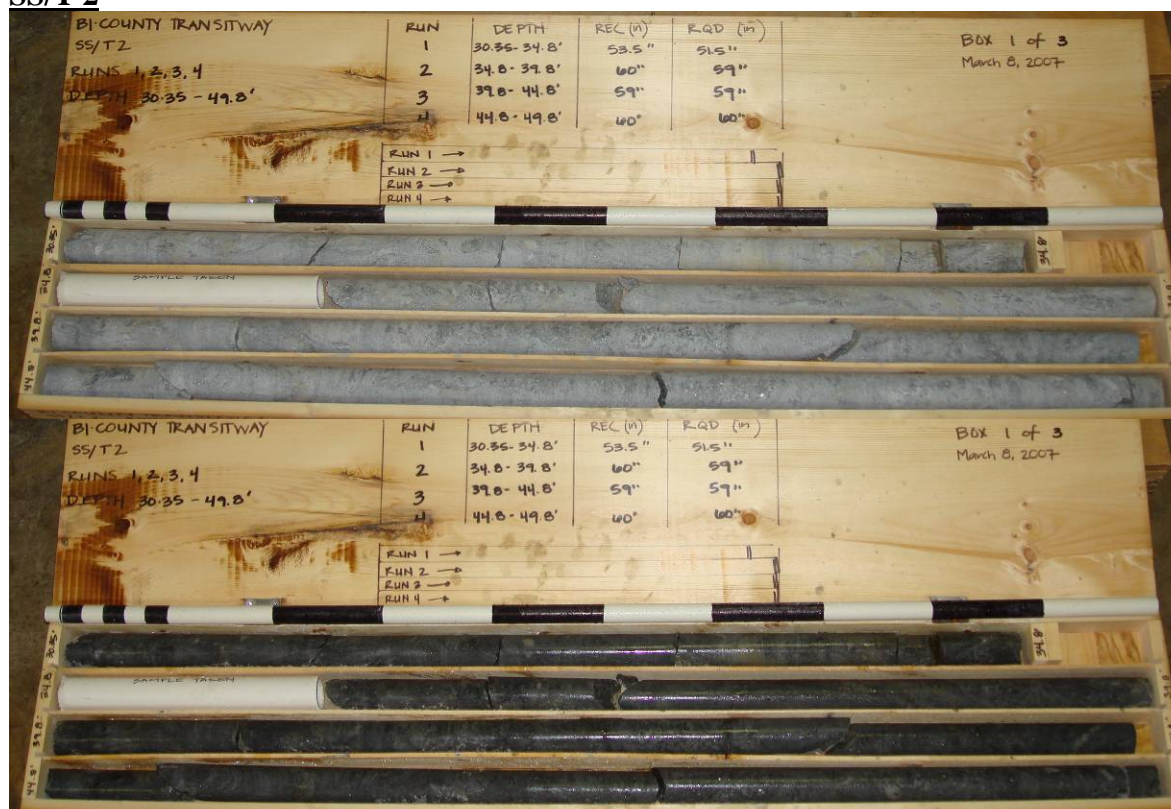


SS/T 1 from 65.0 ft to 85.0 ft in box 2 of 3 (Shown dry and wet)

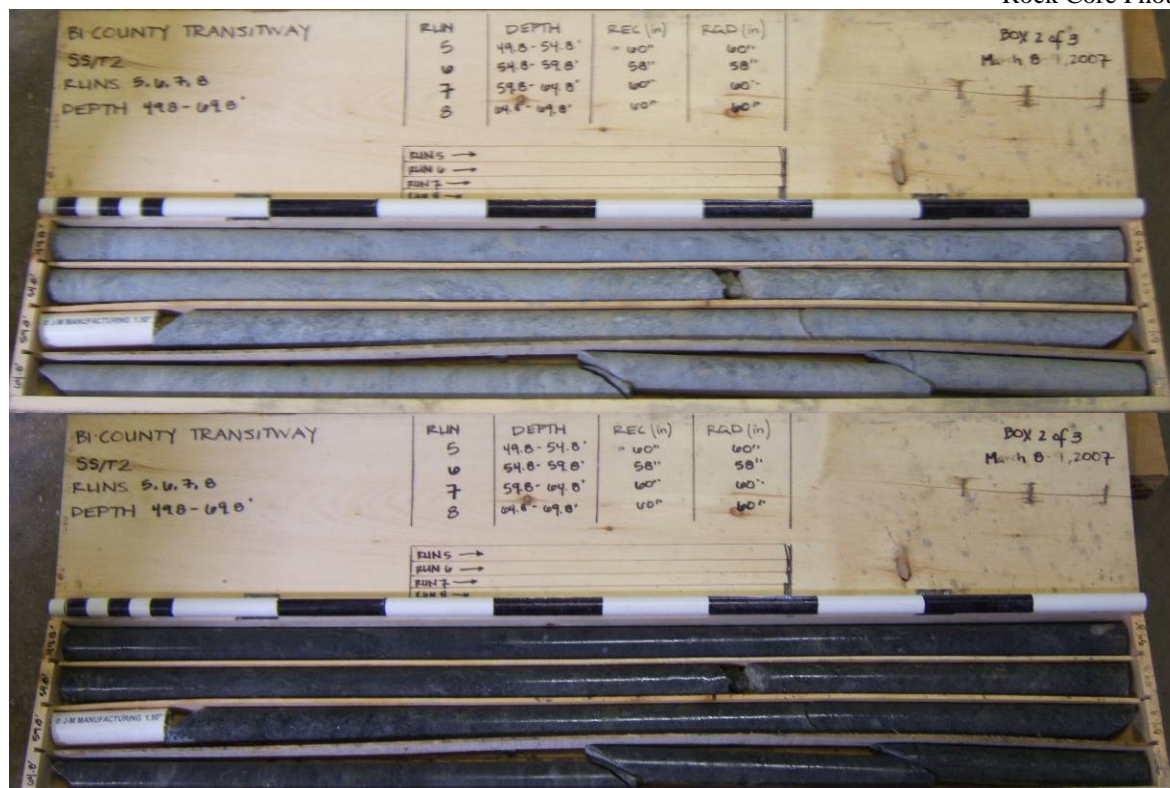


SS/T 1 from 85.0 ft to 90.0 ft in box 3 of 3 (Shown dry and wet)

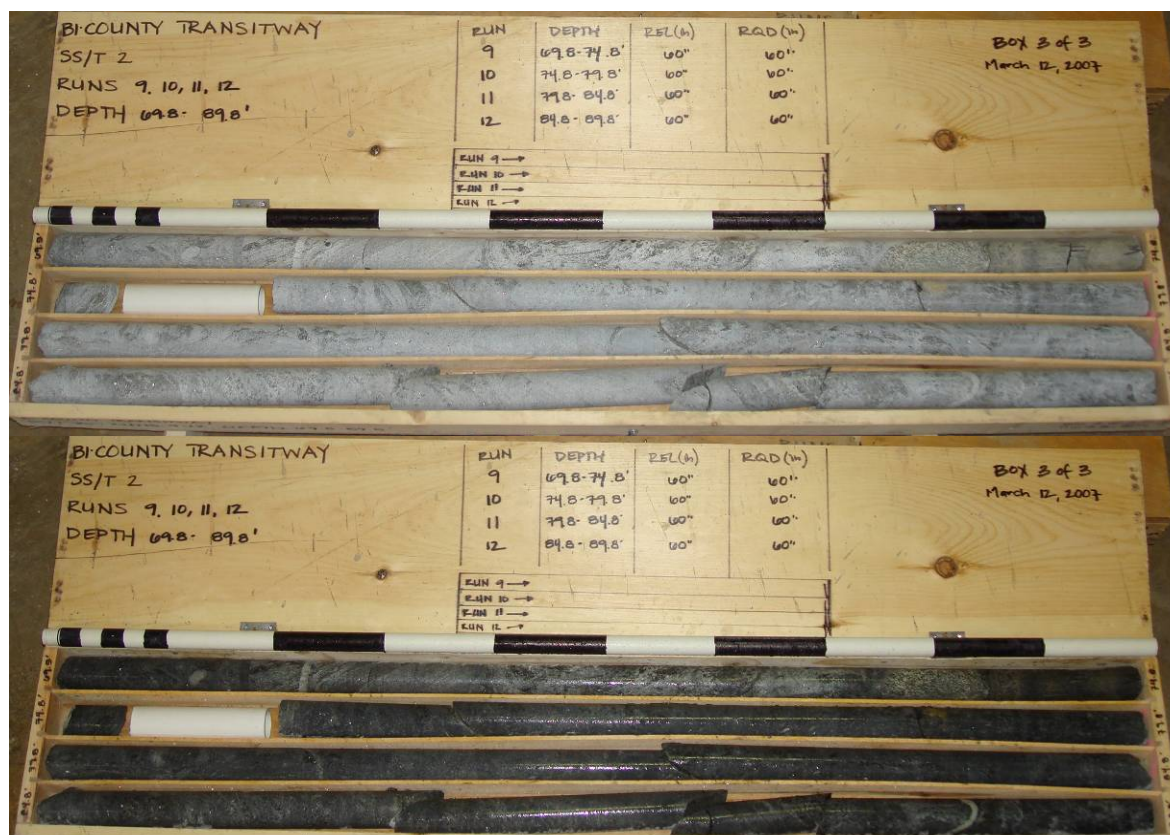
SS/T 2



SS/T 2 from 30.35 ft to 49.8 ft in box 1 of 3 (Shown dry and wet)



SS/T 2 from 49.8 ft to 69.8 ft in box 2 of 3 (Shown dry and wet)

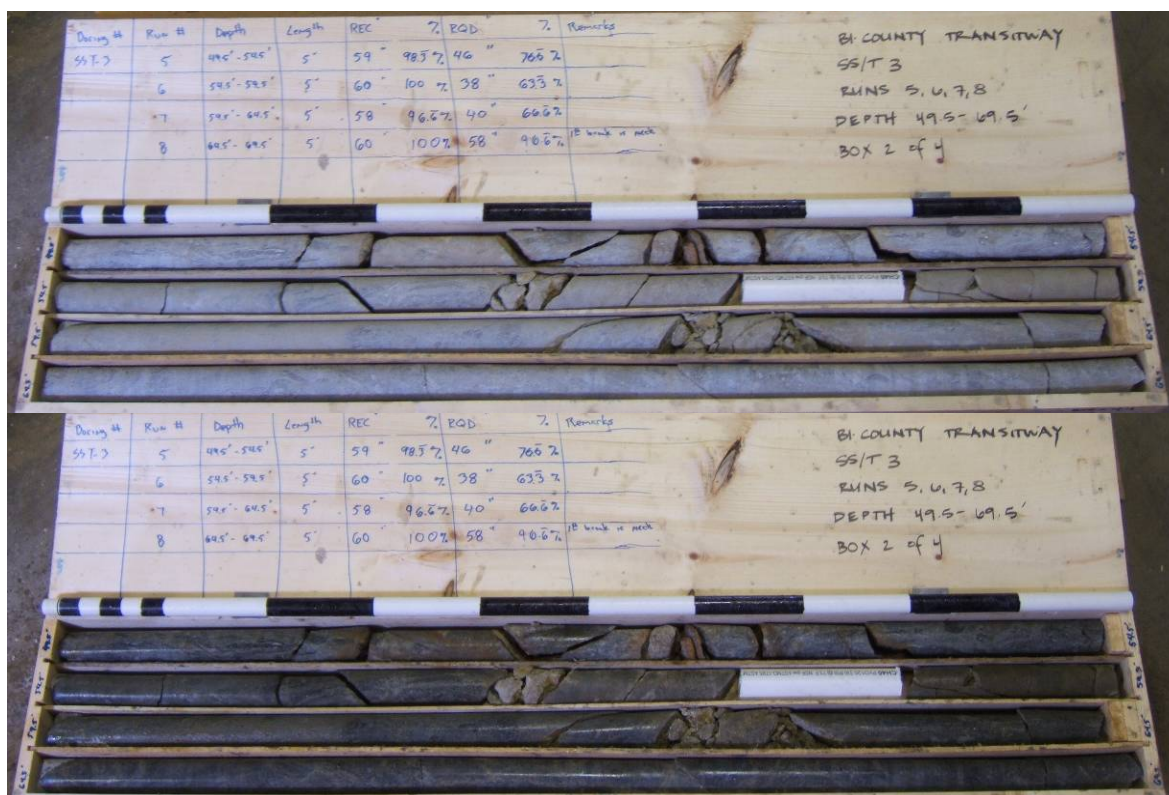


SS/T 2 from 69.8 ft to 89.8 ft in box 3 of 3 (Shown dry and wet)

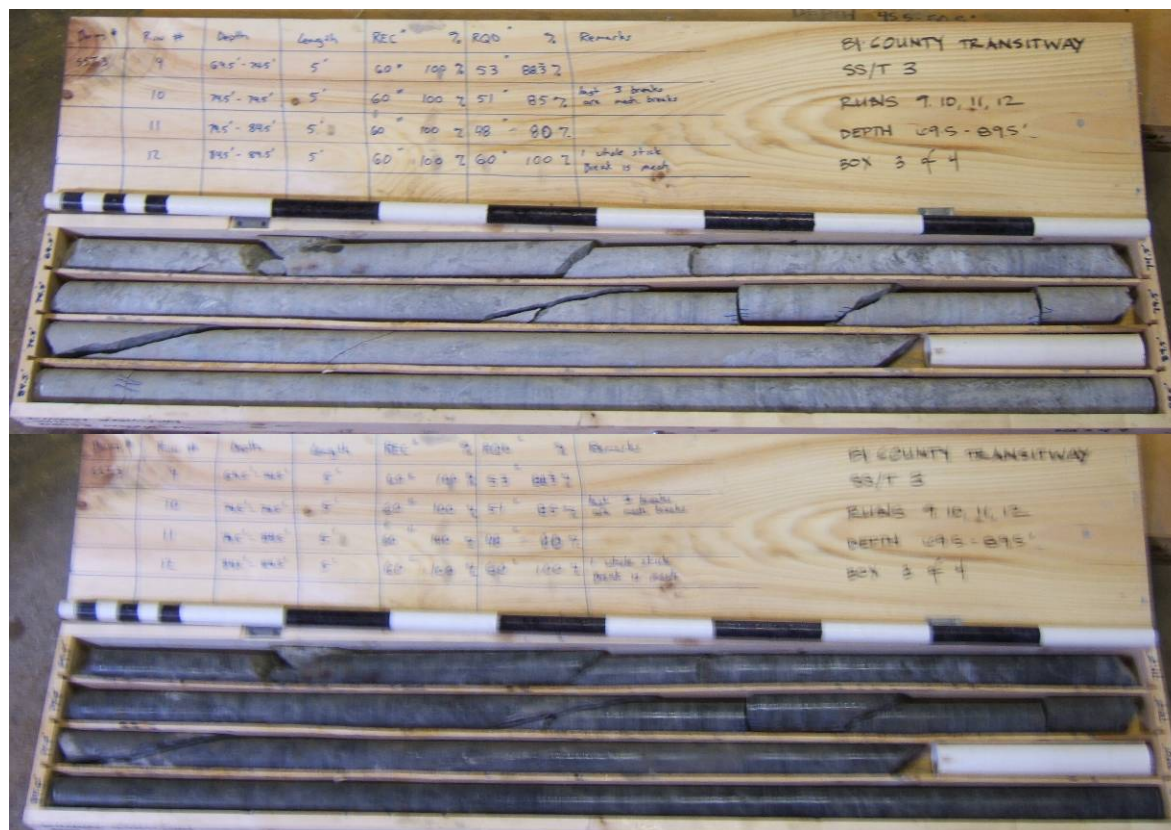
SS/T 3



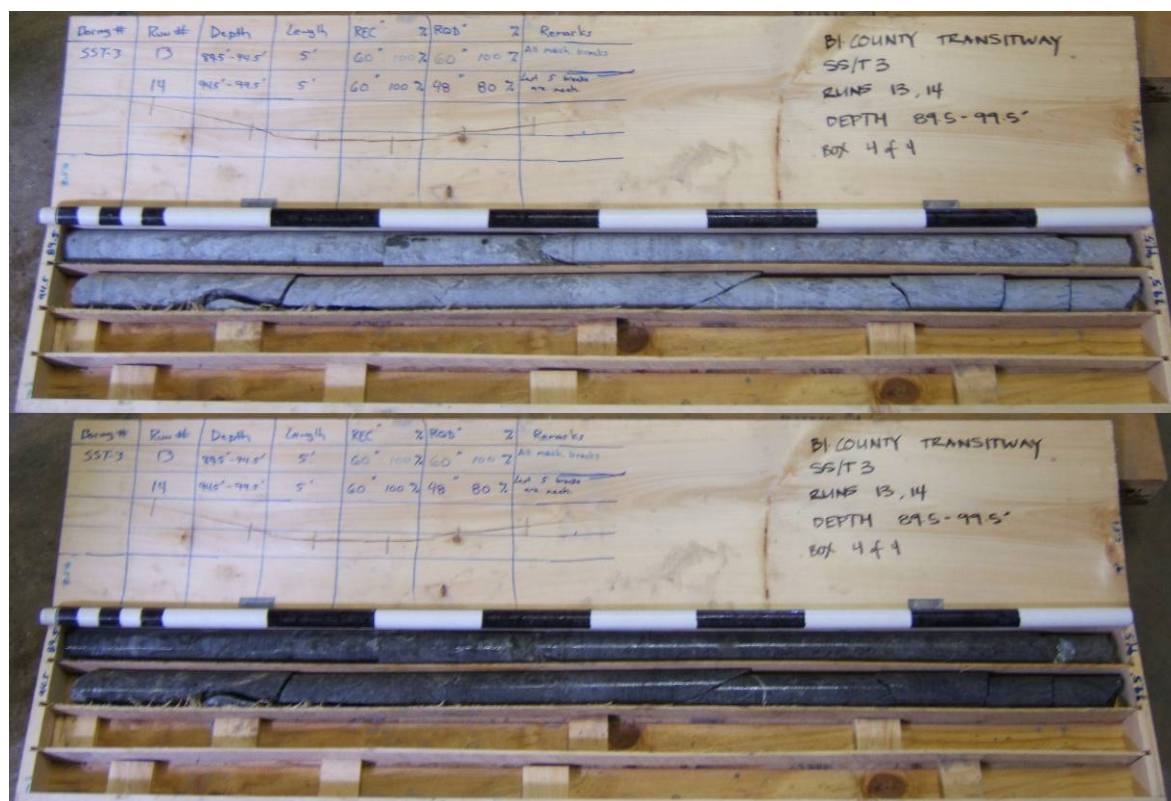
SS/T 3 from 32.5 ft to 49.5 ft in box 1 of 4 (Shown dry and wet)



SS/T 3 from 49.5 ft to 69.5 ft in box 2 of 4 (Shown dry and wet)



SS/T 3 from 69.5 ft to 89.5 ft in box 3 of 4 (Shown dry and wet)

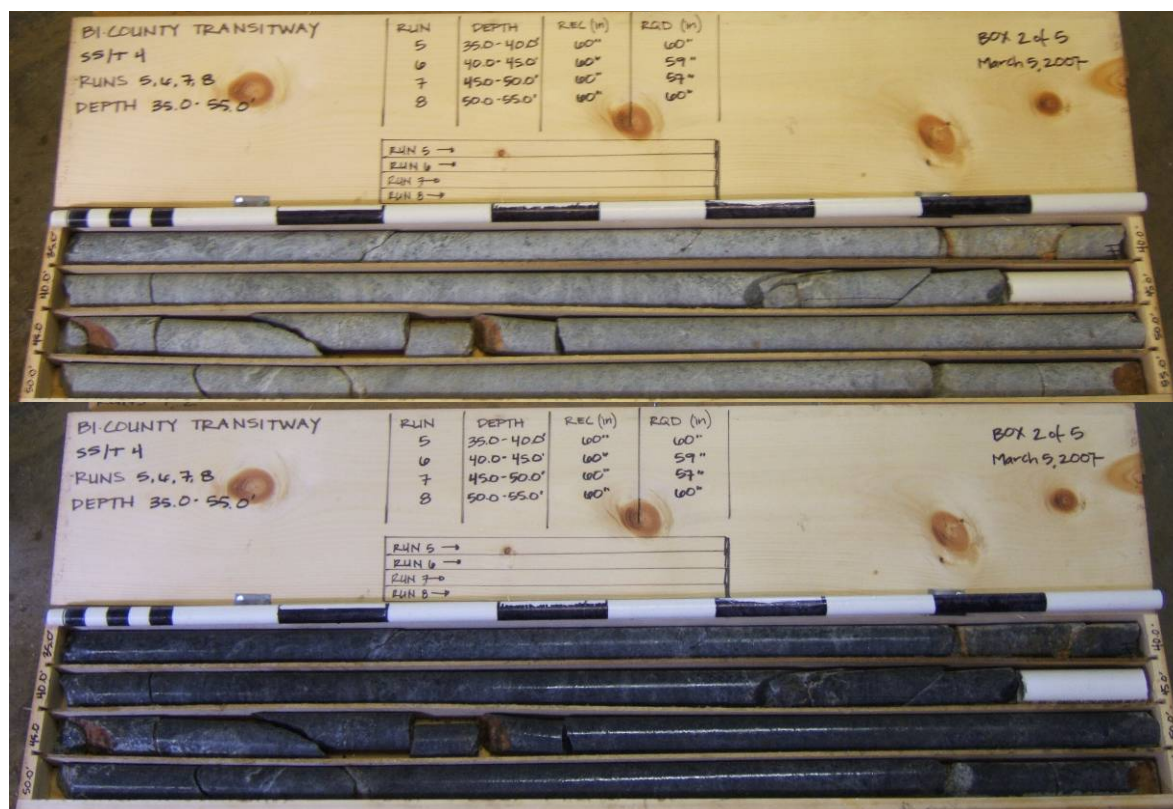


SS/T 3 from 89.5 ft to 99.5 ft in box 4 of 4 (Shown dry and wet)

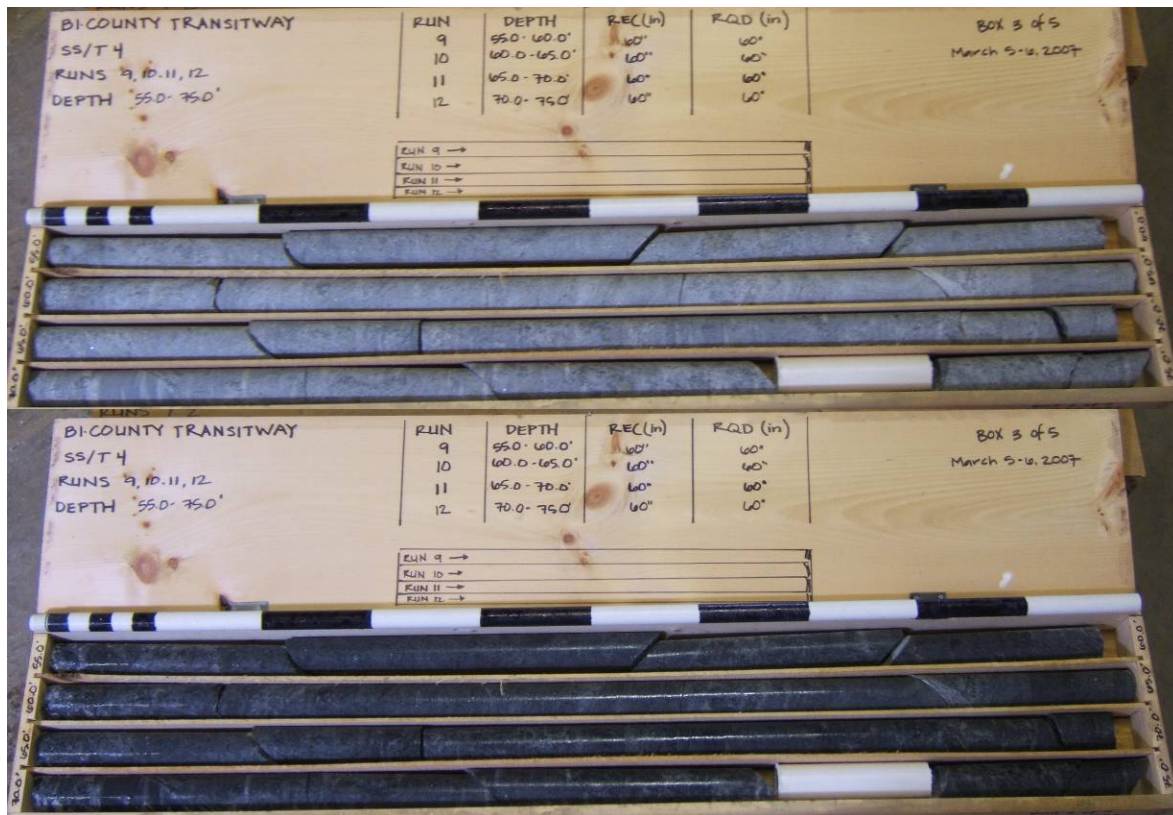
SS/T 4



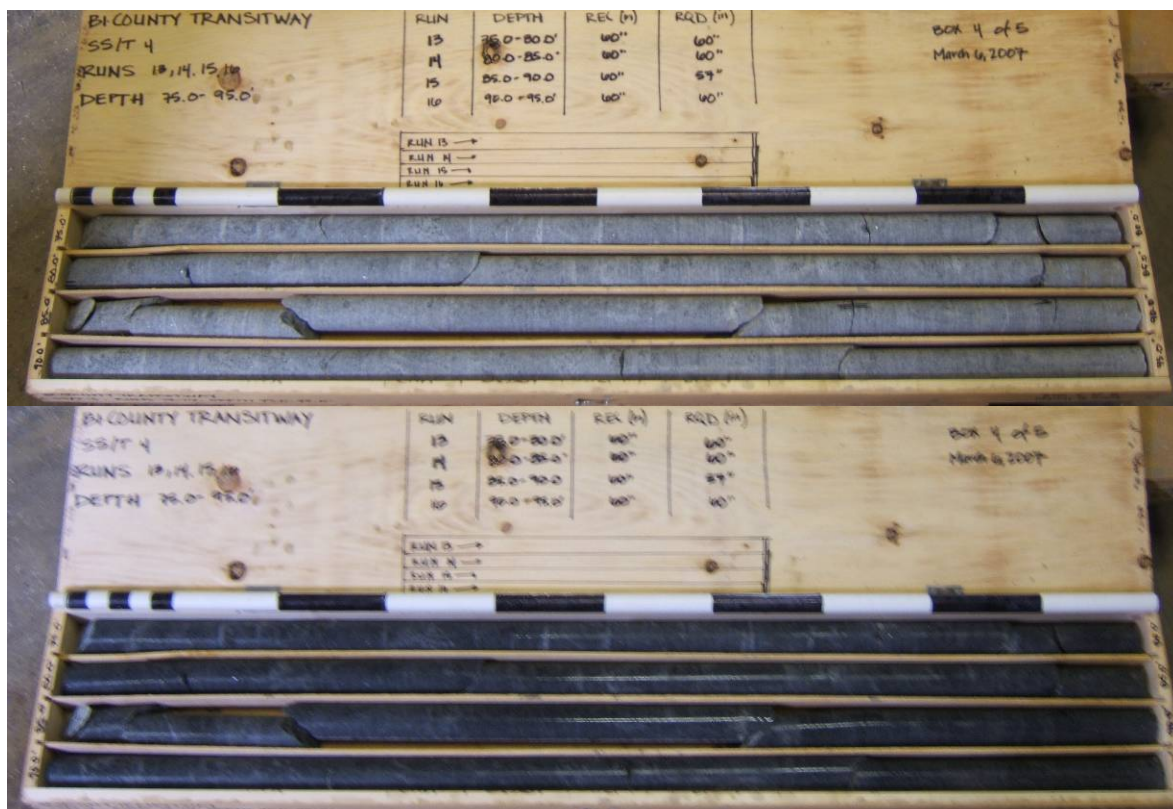
SS/T 4 from 15.75 ft to 35.0 ft in box 4 of 5 (Shown dry and wet)



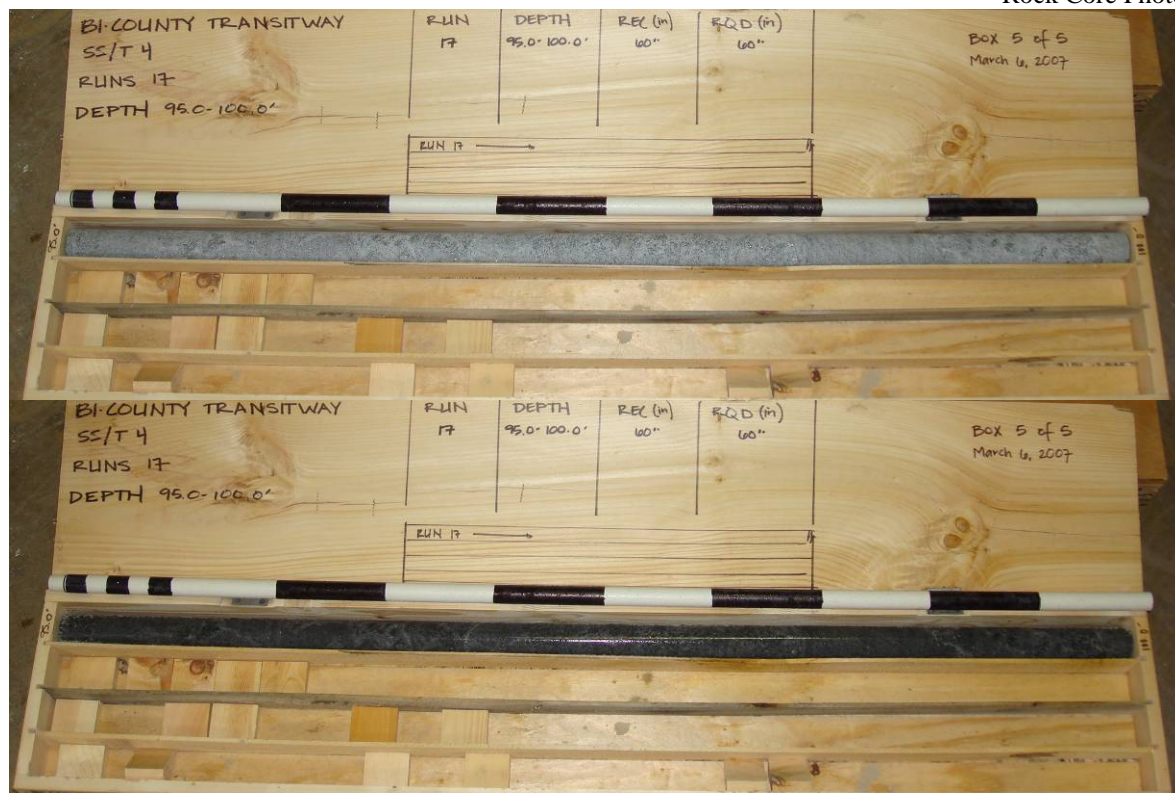
SS/T 4 from 35.0 ft to 55.0 ft in box 2 of 5 (Shown dry and wet)



SS/T 4 from 55.0 ft to 75.0 ft in box 3 of 5 (Shown dry and wet)



SS/T 4 from 75.0 ft to 95.0 ft in box 4 of 5 (Shown dry and wet)



SS/T 5

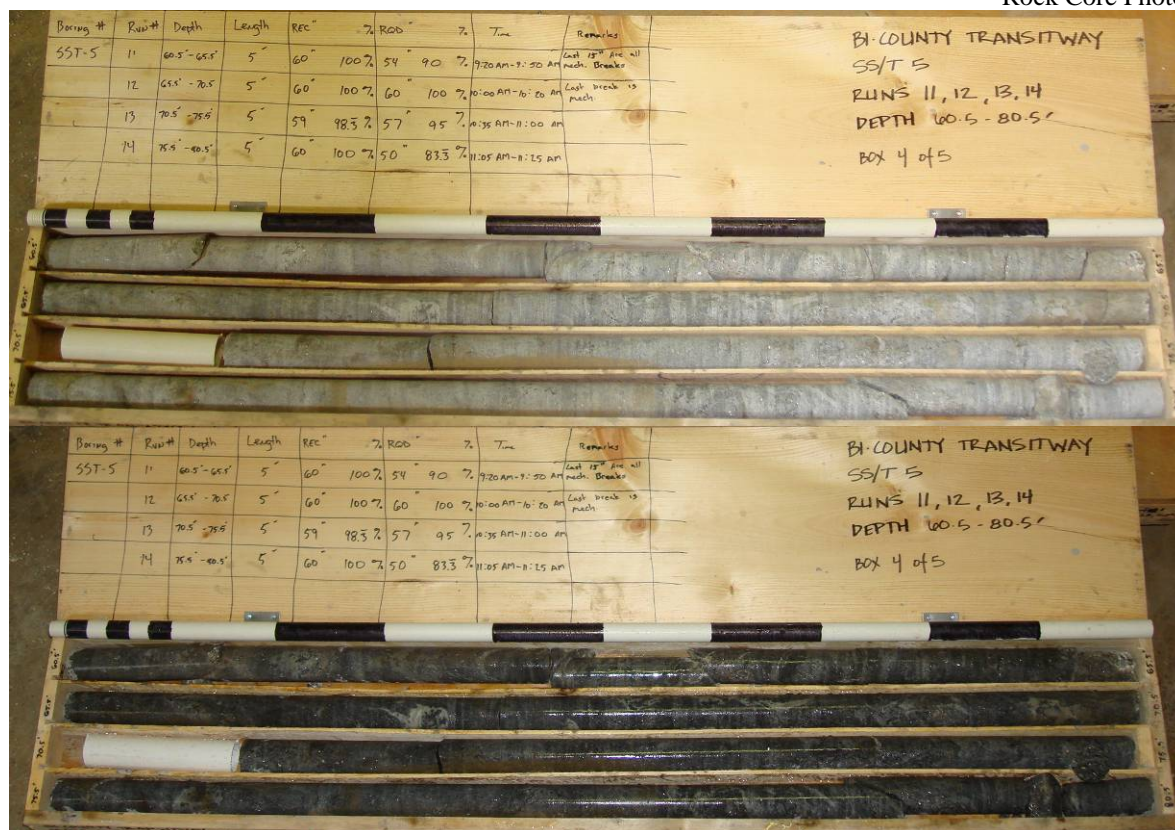




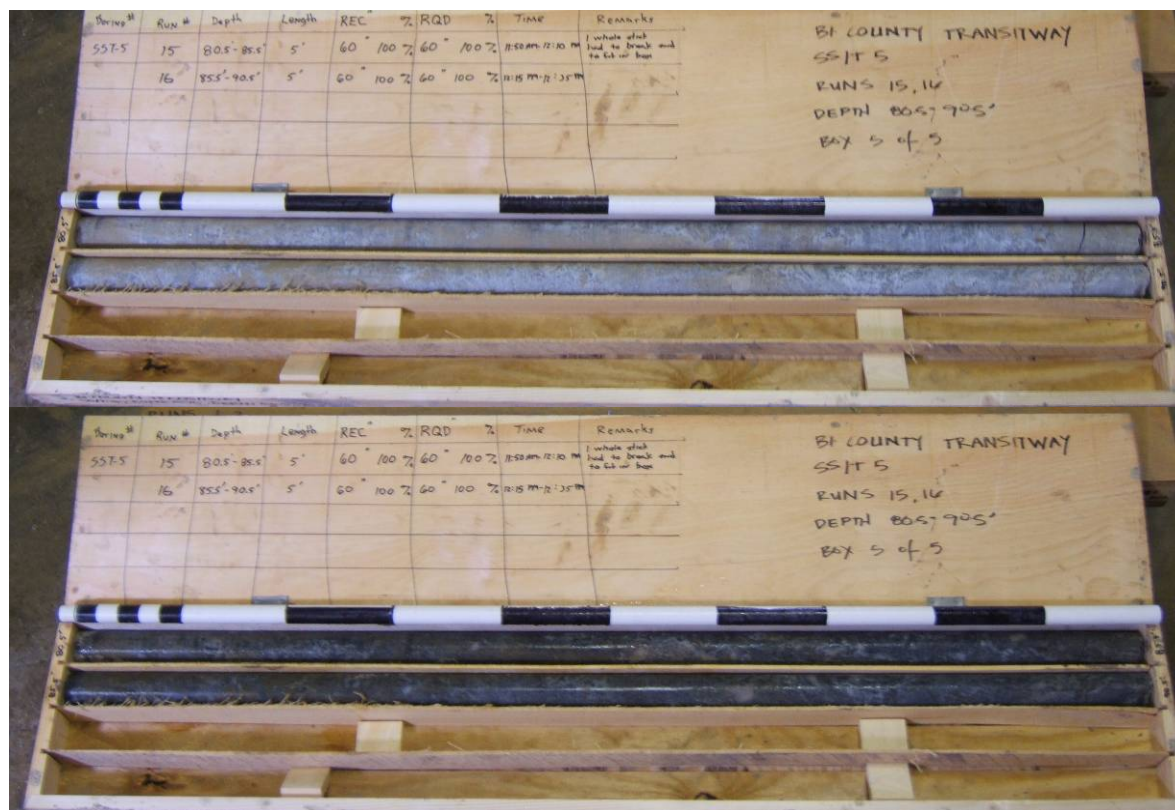
SS/T 5 from 25.5 ft to 45.5 ft in box 2 of 5 (Shown dry and wet)



SS/T 5 from 45.5 ft to 60.5 ft in box 3 of 5 (Shown dry and wet)



SS/T 5 from 60.5 ft to 80.5 ft in box 4 of 5 (Shown dry and wet)

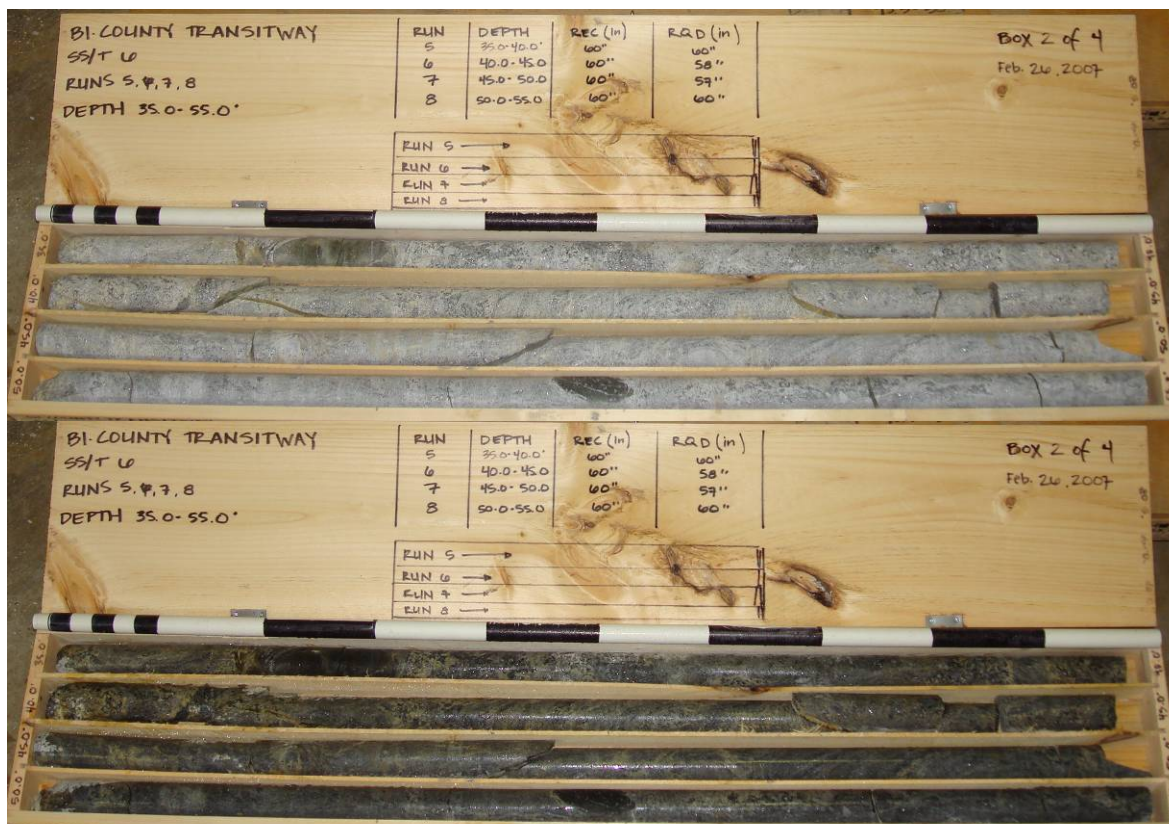


SS/T 5 from 80.5 ft to 90.5 ft in box 5 of 5 (Shown dry and wet)

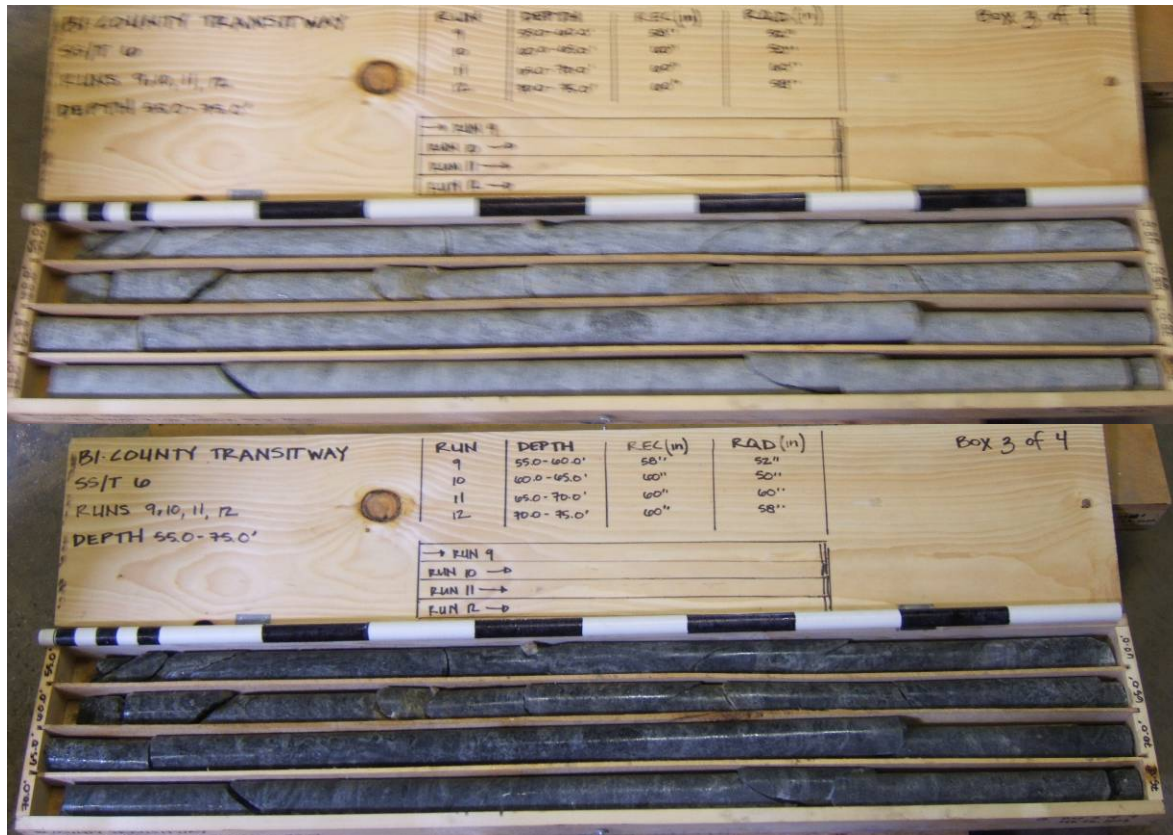
SS/T 6



SS/T 6 from 17.5 ft to 35.0 ft in box 1 of 4 (Shown dry and wet)



SS/T 6 from 35.0 ft to 55.0 ft in box 2 of 4 (Shown dry and wet)

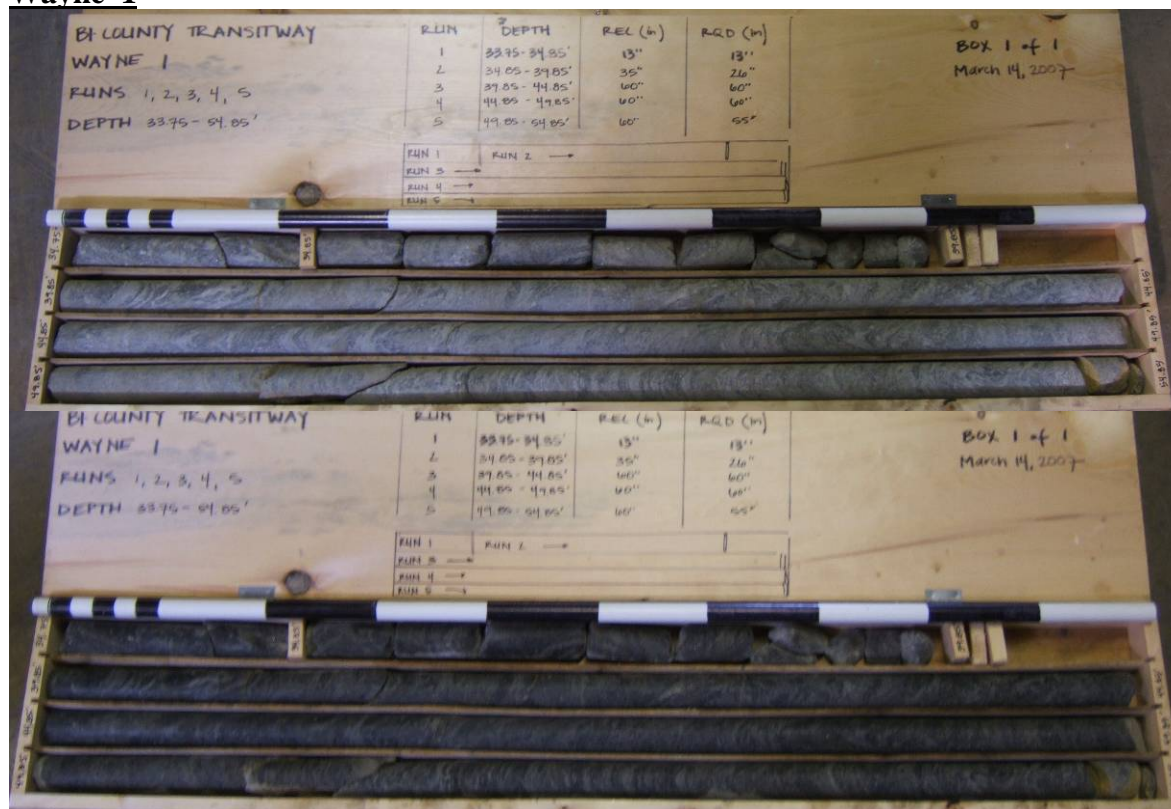


SS/T 6 from 55.0 ft to 75.0 ft in box 3 of 4 (Shown dry and wet)



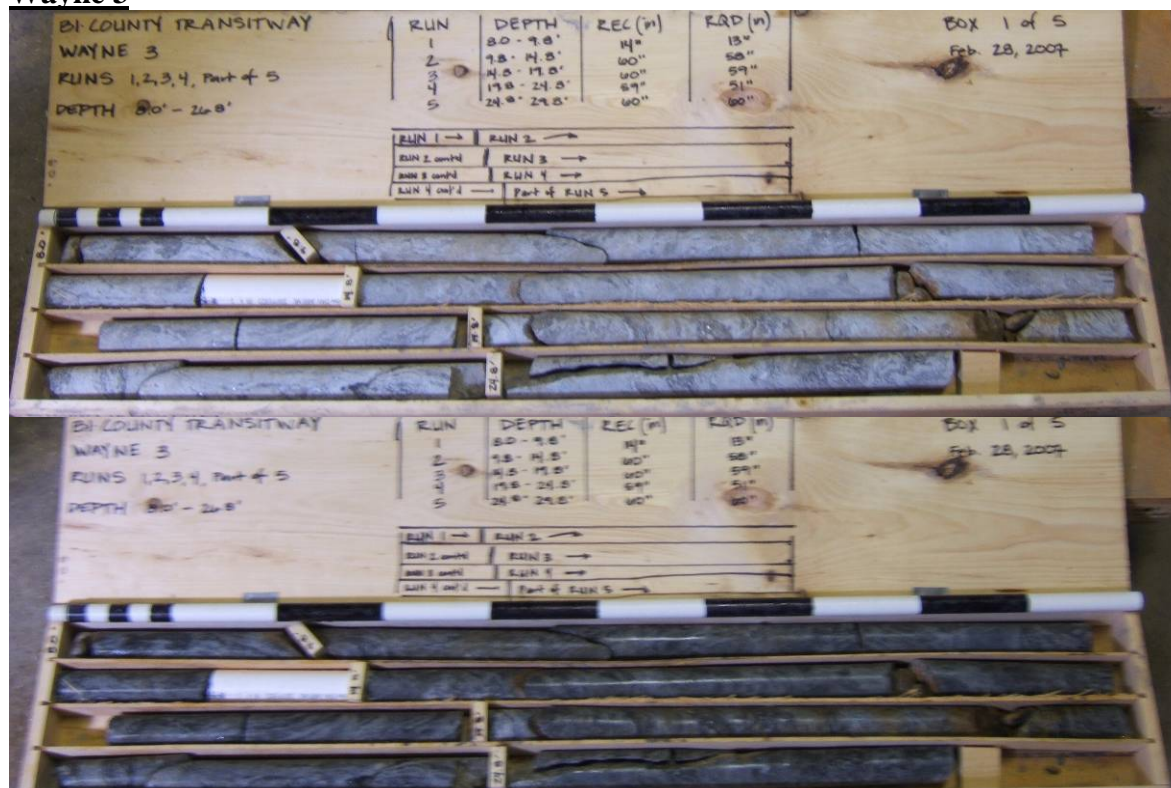
SS/T 6 from 75.0 ft to 90.0 ft in box 4 of 4 (Shown dry and wet)

Wayne 1



Wayne 1 from 33.75 ft to 54.85 ft in box 1 of 1 (Shown dry and wet)

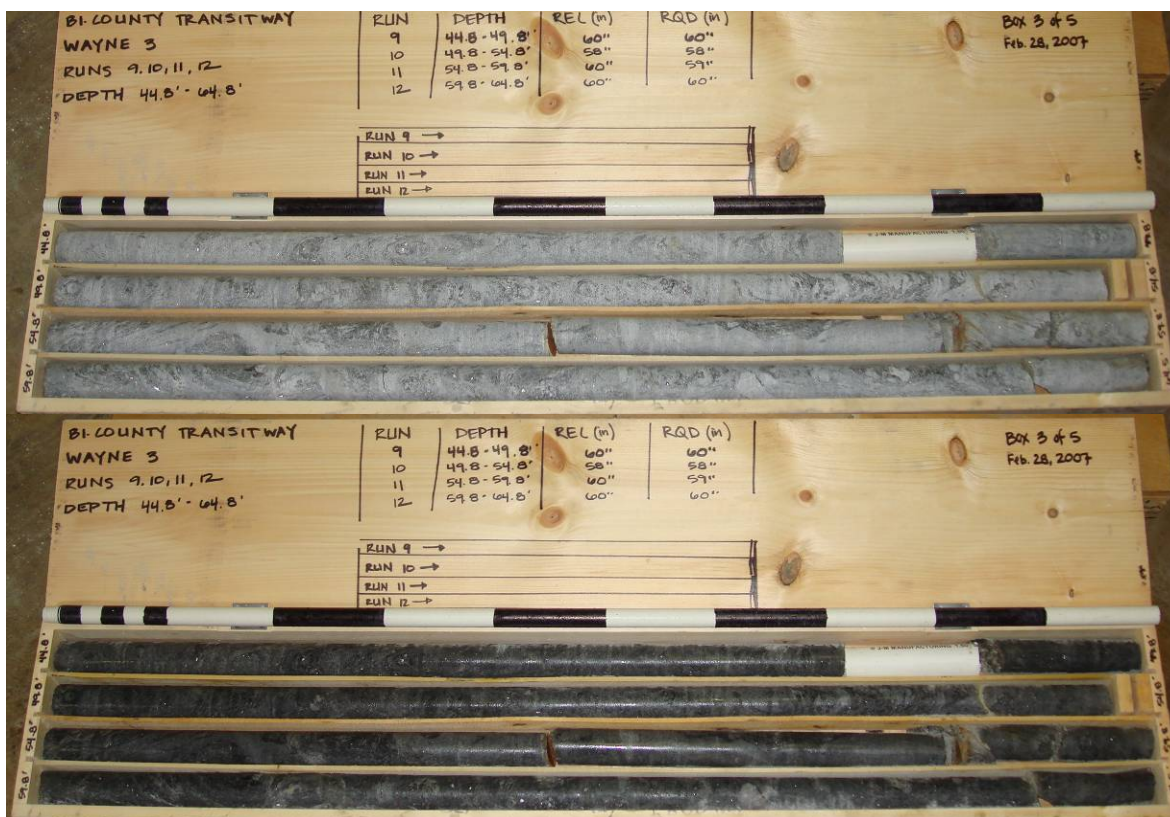
Wayne 3



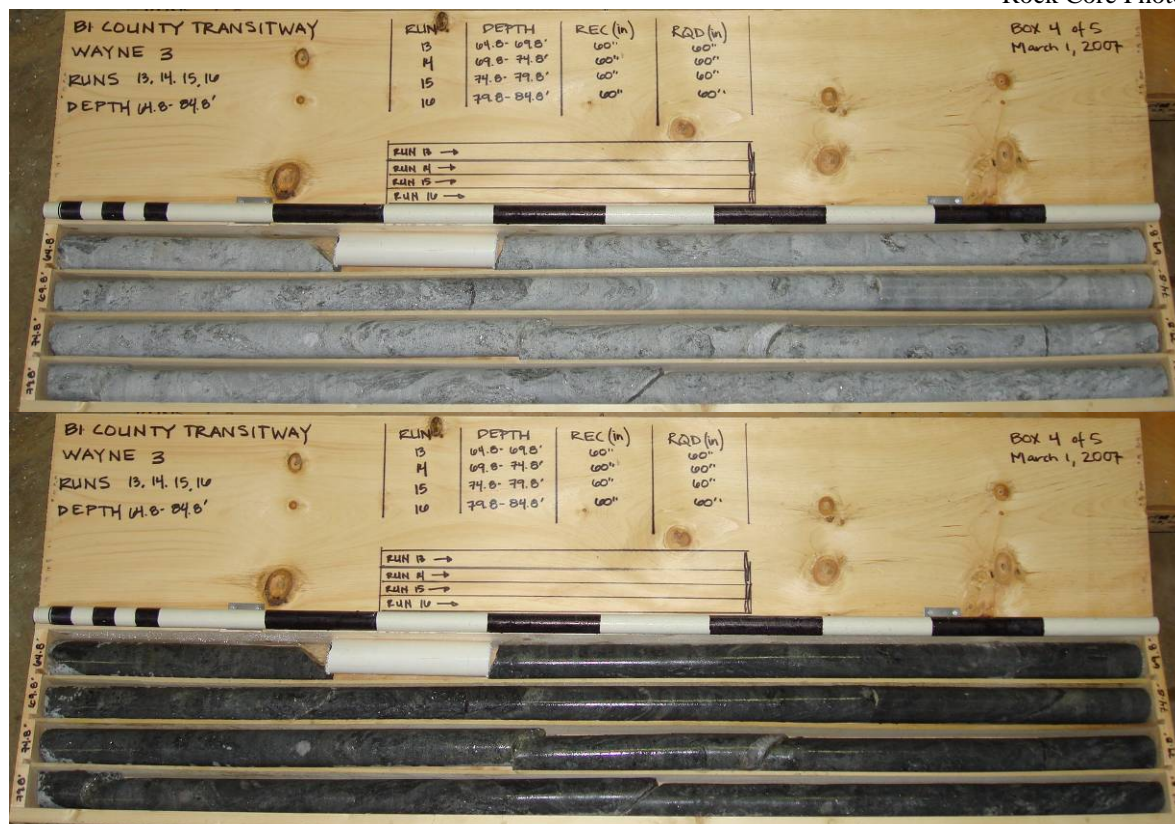
Wayne 3 from 8.0 ft to 26.8 ft in box 1 of 5 (Shown dry and wet)



Wayne 3 from 26.8 ft to 44.8 ft in box 2 of 5 (Shown dry and wet)



Wayne 3 from 44.8 ft to 64.8 ft in box 3 of 5 (Shown dry and wet)

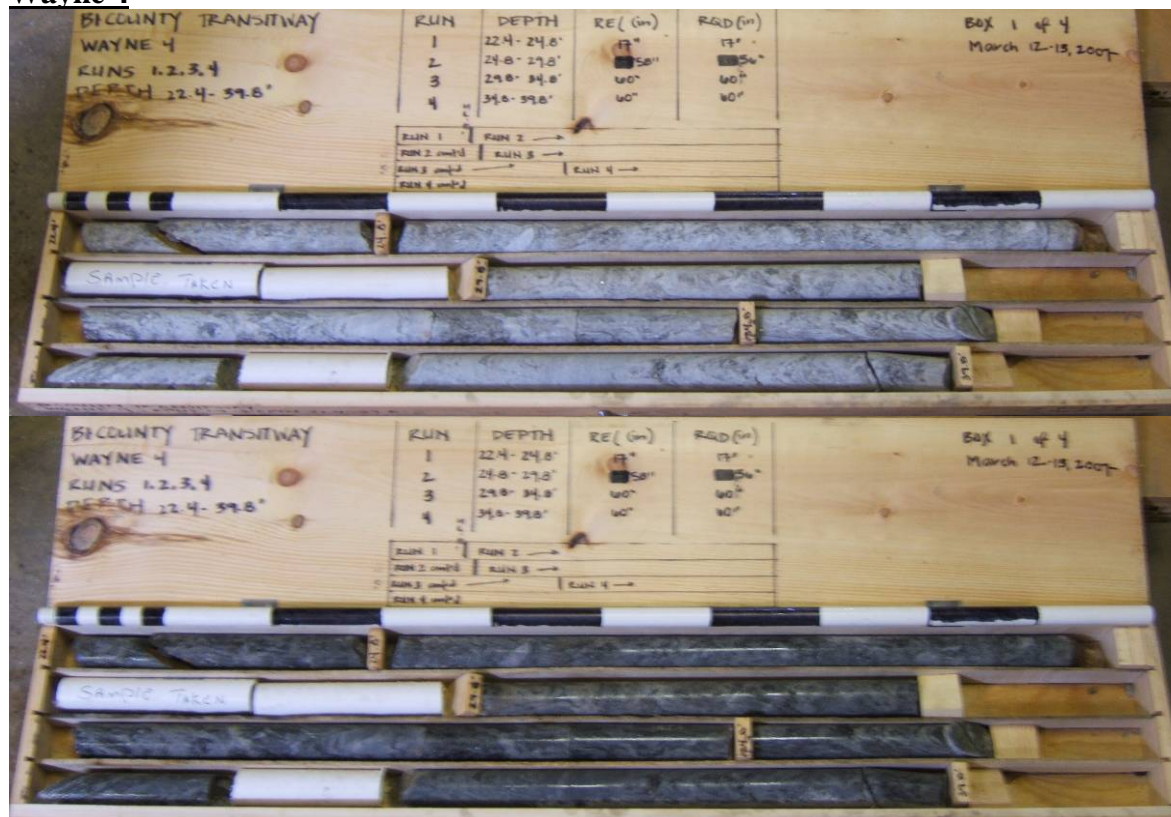


Wayne 3 from 64.8 ft to 84.8 ft in box 4 of 5 (Shown dry and wet)



Wayne 3 from 84.8 ft to 99.8 ft in box 5 of 5 (Shown dry and wet)

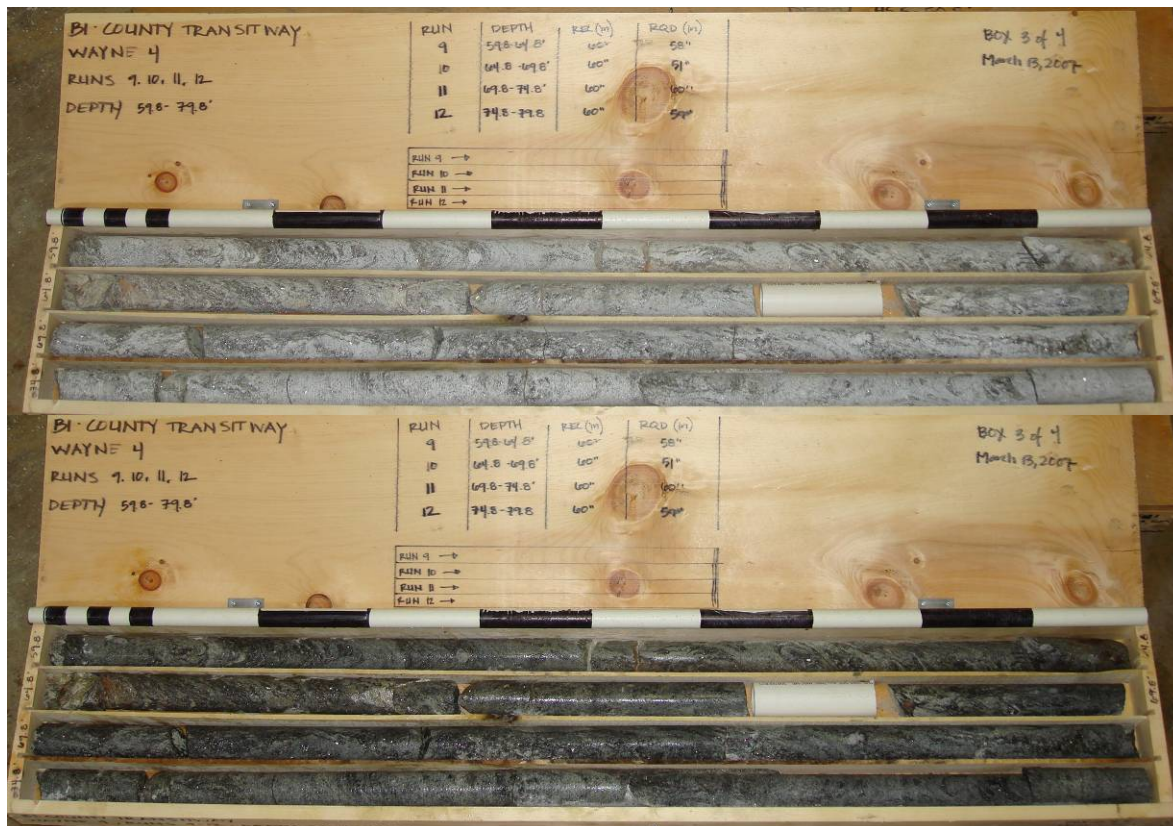
Wayne 4



Wayne 4 from 22.4 ft to 39.8 ft in box 1 of 4 (Shown dry and wet)



Wayne 4 from 39.8 ft to 59.8 ft in box 2 of 4 (Shown dry and wet)

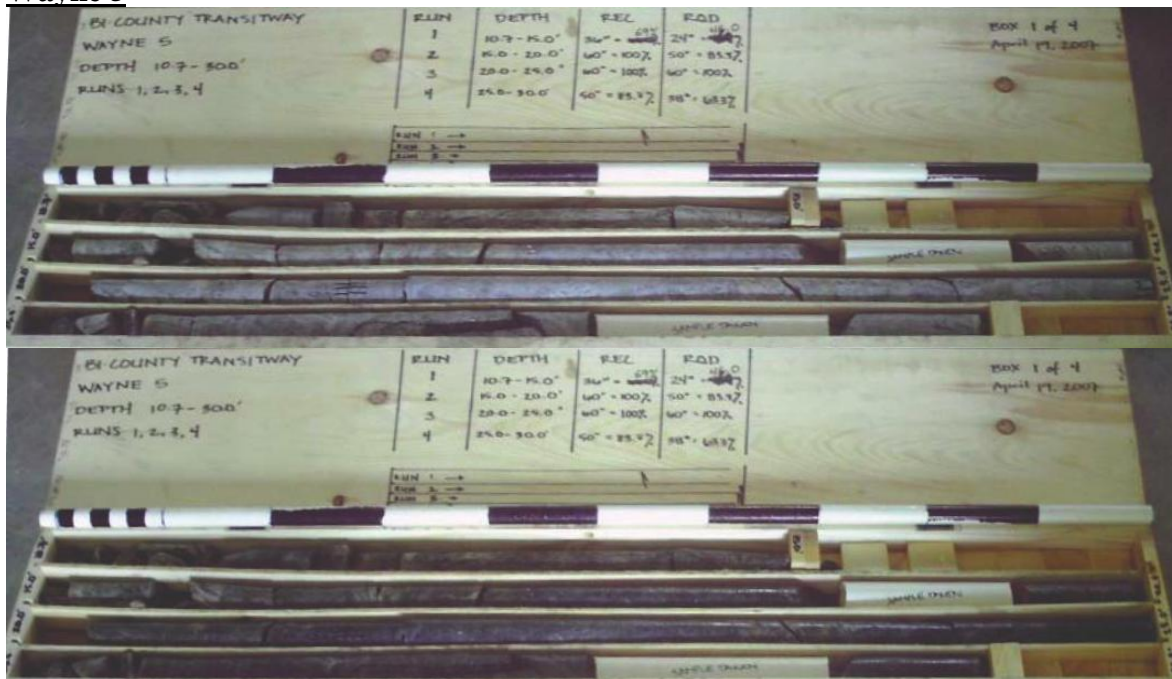


Wayne 4 from 59.8 ft to 79.8 ft in box 3 of 4 (Shown dry and wet)

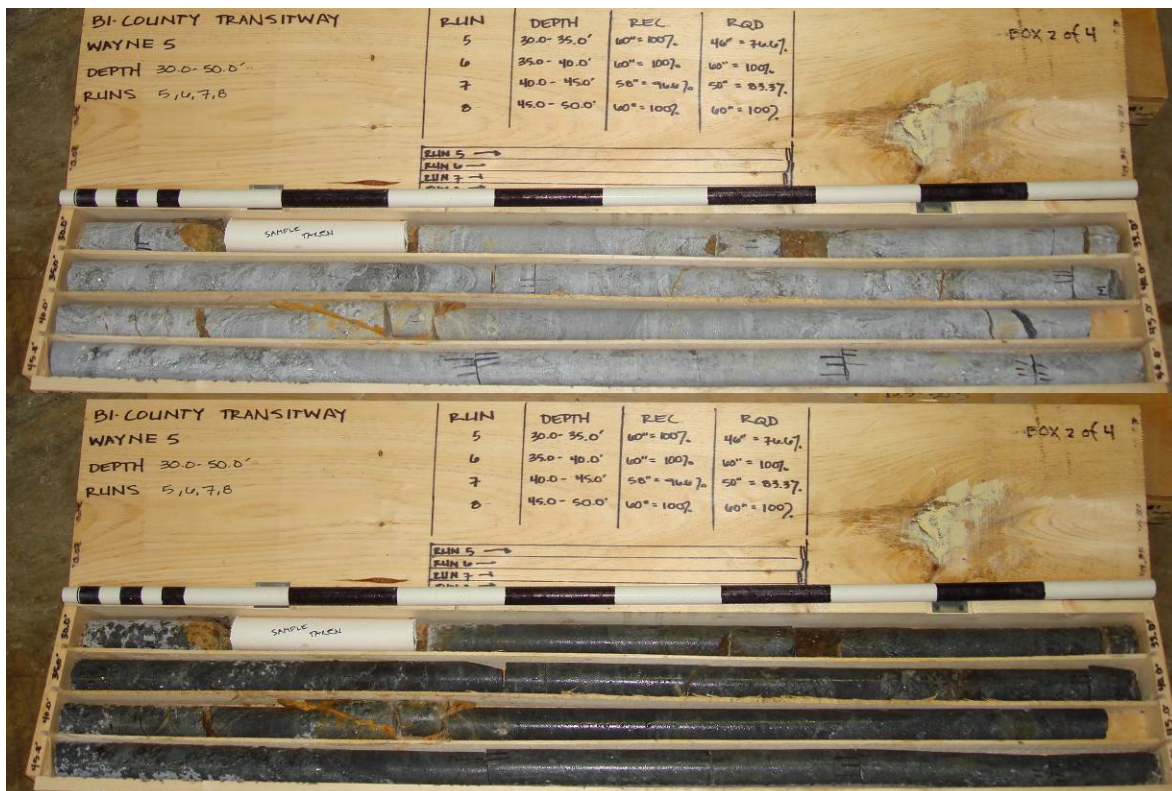


Wayne 4 from 79.8 ft to 99.8 ft in box 4 of 4 (Shown dry and wet)

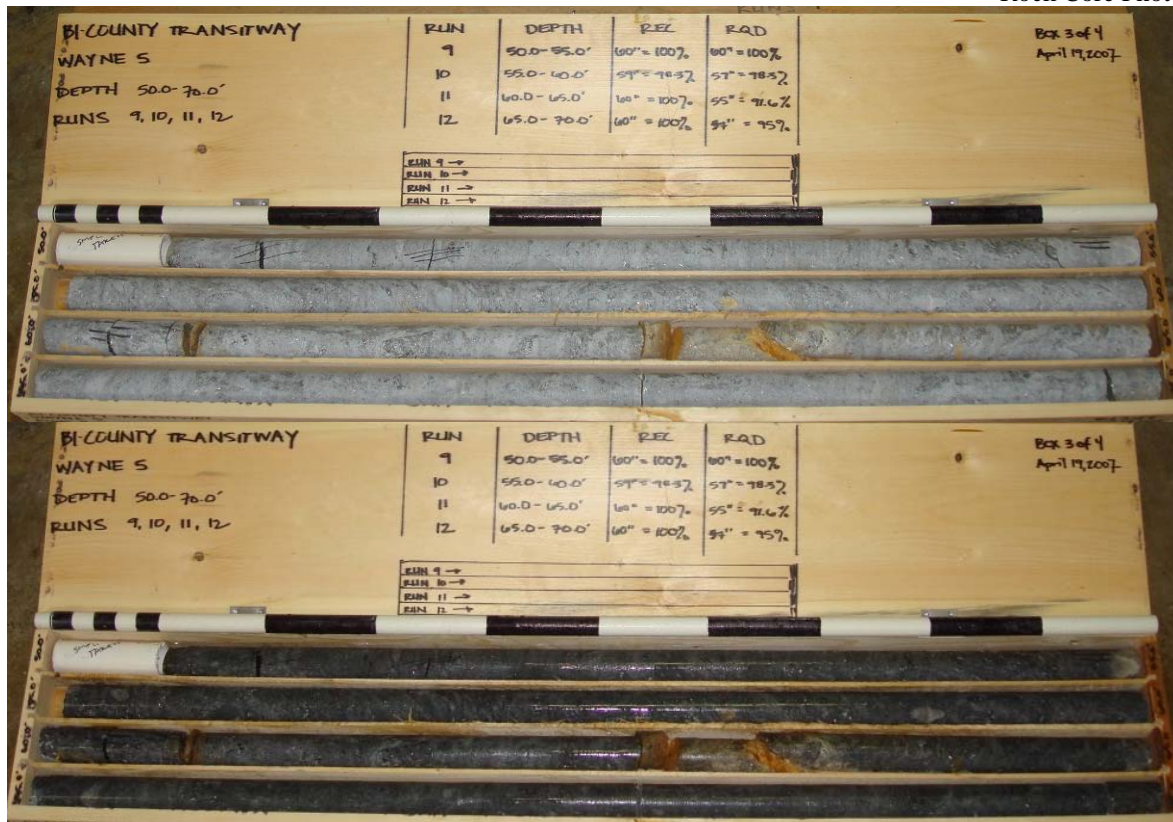
Wayne 5



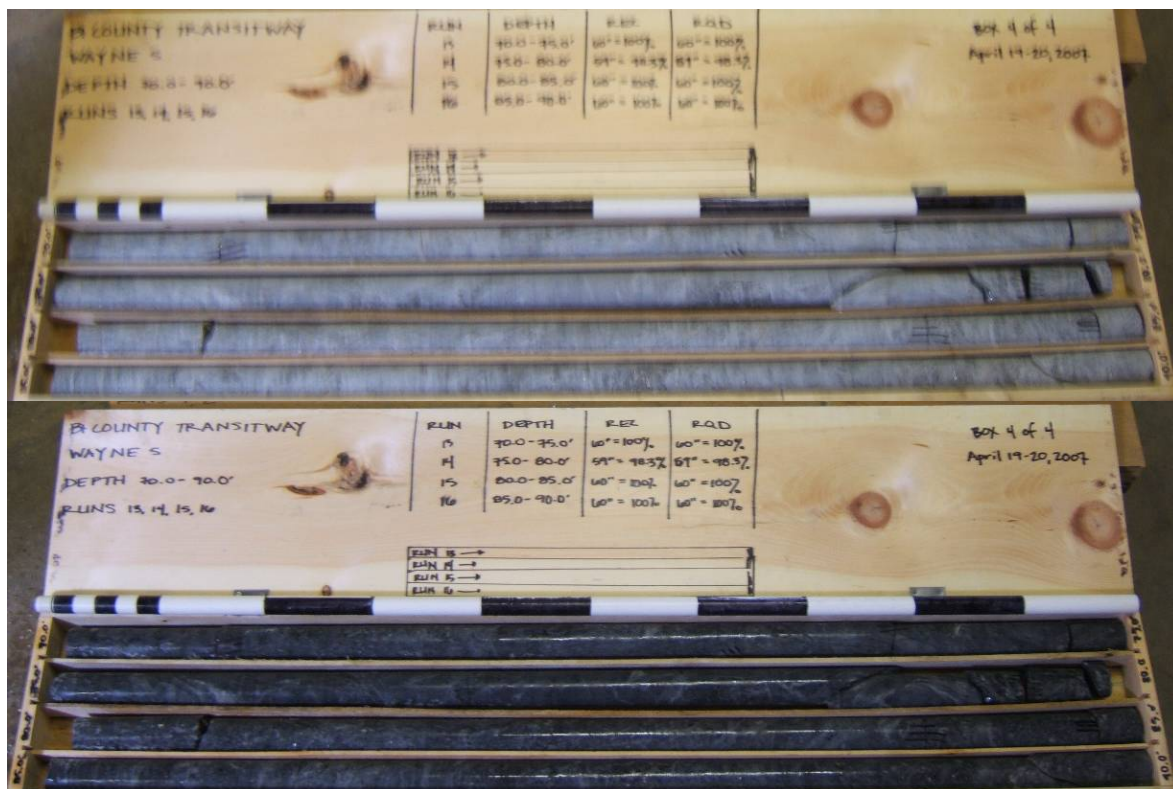
Wayne 5 from 10.7 ft to 30.0 ft in box 1 of 4 (Shown dry and wet)



Wayne 5 from 30.0 ft to 50.0 ft in box 2 of 4 (Shown dry and wet)



Wayne 5 from 50.0 ft to 70.0 ft in box 3 of 4 (Shown dry and wet)



Wayne 5 from 70.0 ft to 90.0 ft in box 4 of 4 (Shown dry and wet)



Appendix M
Silver Spring Groundwater
Observation Well Construction
Logs and Readings



Parsons
Brinckerhoff

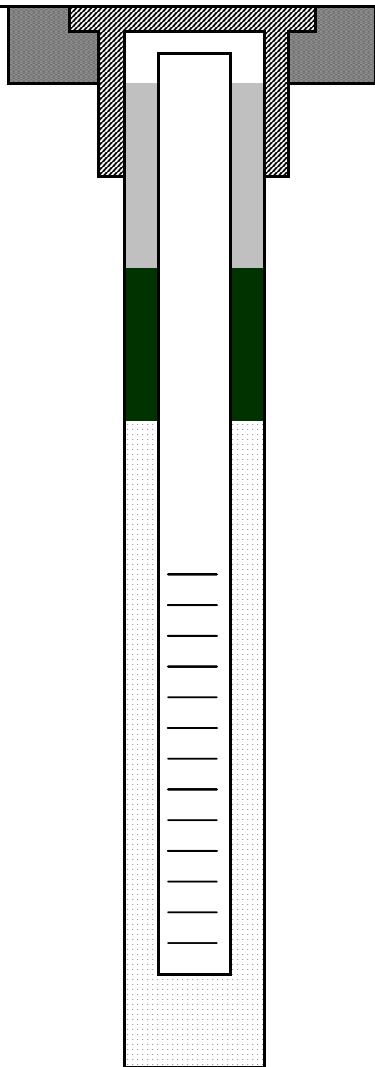
100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Manchester 2
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	3/28/2007
Project Location:	Silver Spring, MD	Ground EL:	263.4 (feet)	Logged By:	M. Wrightson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickrete
(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickrete
(Type)

TOP OF SEAL: (feet) 72.5

SEAL CONSTRUCTION: bentonite
(Thickness & Type)

TOP OF SANDPACK: (feet) 74.65

RISER CONSTRUCTION: solid 3/4" inside dia. pvc
(Type, Diameter Material)

TOP OF SCREEN: (feet) 76.65

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc
(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 86.65

BOTTOM OF BOREHOLE: (feet) 90.0

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

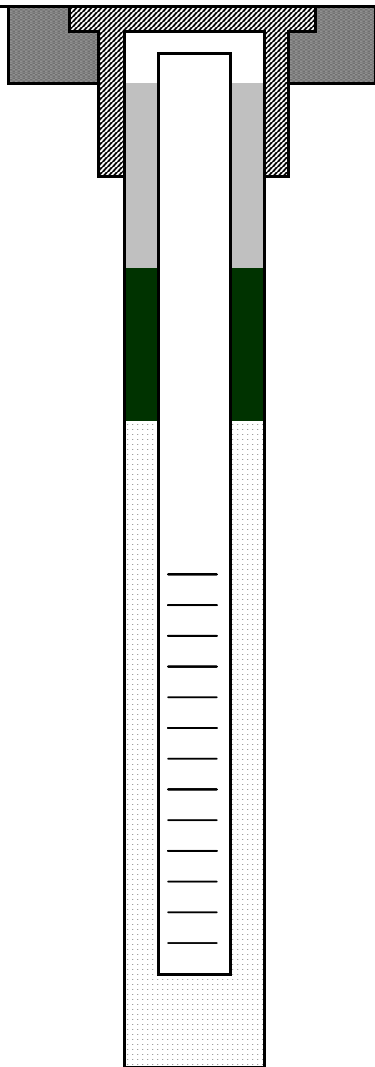
100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Plymouth 2
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	4/2/2007
Project Location:	Silver Spring, MD	Ground EL:	317.1 (feet)	Logged By:	C. Nicholson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickcrete
(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickcrete
(Type)

TOP OF SEAL: (feet) 79.5

SEAL CONSTRUCTION: bentonite
(Thickness & Type)

TOP OF SANDPACK: (feet) 81.9

RISER CONSTRUCTION: solid 3/4" inside dia. pvc
(Type, Diameter Material)

TOP OF SCREEN: (feet) 83.9

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc
(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 93.9

BOTTOM OF BOREHOLE: (feet) 100.0

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Sligo 1
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	2/12/2007
Project Location:	Silver Spring, MD	Ground EL:	335.9 (feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	338.4 (feet)	Page:	1 of 1

	GROUND SURFACE	LOCKED PROTECTIVE CASING	SURFACE SEAL: (Thickness & Type)	Steel riser casing set in quickrete
			BACKFILL MATERIAL: (Type)	bentonite and quickrete
			TOP OF SEAL: (feet)	69.0
			SEAL CONSTRUCTION: (Thickness & Type)	bentonite
			TOP OF SANDPACK: (feet)	71.8
			RISER CONSTRUCTION: (Type, Diameter & Material)	solid 3/4" inside dia. pvc
			TOP OF SCREEN: (feet)	73.8
			SANDPACK TYPE:	#2 Silica Sand
			SCREEN MATERIAL: (Type, Slot, Diameter & Material)	0.01-inch slotted 3/4" inside dia. pvc
			BOTTOM OF SCREEN: (feet)	83.8
			BOTTOM OF BOREHOLE: (feet)	90.0
			BOREHOLE DIAMETER: (inch)	3.0

Remarks:



Parsons
Brinckerhoff

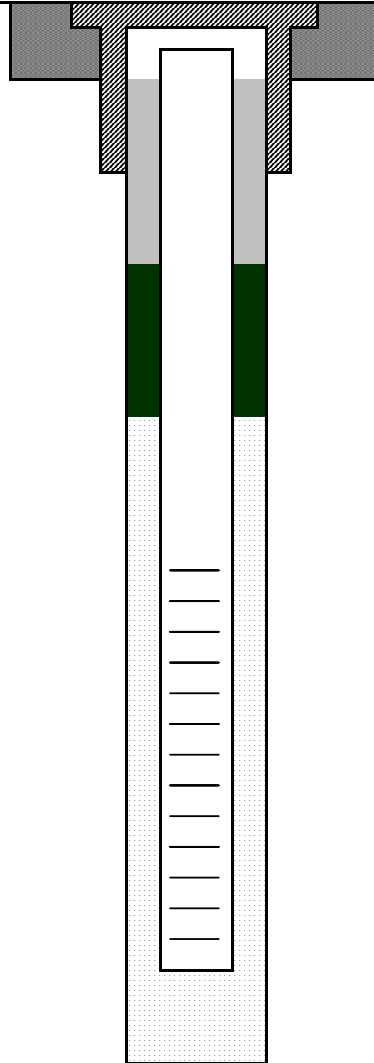
100 S. Charles Street
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(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Sligo 4
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	2/22/2007
Project Location:	Silver Spring, MD	Ground EL:	329.3 (feet)	Logged By:	C. Nicholson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickrete

(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickrete

(Type)

TOP OF SEAL: (feet) 61.5

SEAL CONSTRUCTION: bentonite

(Thickness & Type)

TOP OF SANDPACK: (feet) 63.8

RISER CONSTRUCTION: solid 3/4" inside dia. pvc

(Type, Diameter Material)

TOP OF SCREEN: (feet) 65.8

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc

(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 75.8

BOTTOM OF BOREHOLE: (feet) 89.5

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

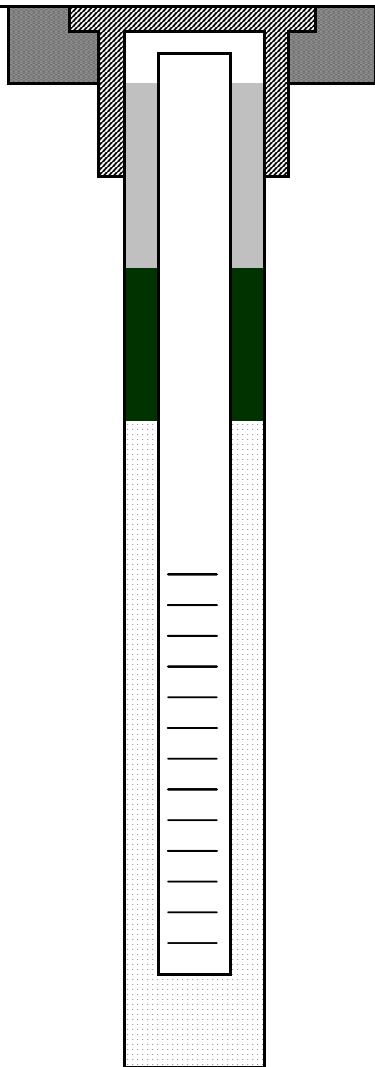
100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Sligo 8
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	4/18/2007
Project Location:	Silver Spring, MD	Ground EL:	244.9 (feet)	Logged By:	C. Nicholson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickcrete
(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickcrete
(Type)

TOP OF SEAL: (feet) 71

SEAL CONSTRUCTION: bentonite
(Thickness & Type)

TOP OF SANDPACK: (feet) 73.1

RISER CONSTRUCTION: solid 3/4" inside dia. pvc
(Type, Diameter Material)

TOP OF SCREEN: (feet) 75.1

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc
(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 85.1

BOTTOM OF BOREHOLE: (feet) 89.7

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

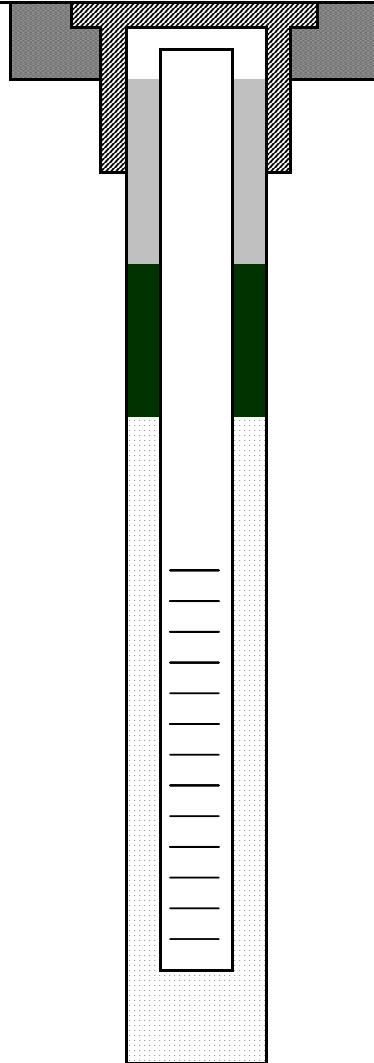
100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	SS/T 2
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	3/12/2007
Project Location:	Silver Spring, MD	Ground EL:	328.8 (feet)	Logged By:	C. Nicholson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickrete

(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickrete

(Type)

TOP OF SEAL: (feet) 66.5

SEAL CONSTRUCTION: bentonite

(Thickness & Type)

TOP OF SANDPACK: (feet) 68.8

RISER CONSTRUCTION: solid 3/4" inside dia. pvc

(Type, Diameter Material)

TOP OF SCREEN: (feet) 70.8

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc

(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 80.8

BOTTOM OF BOREHOLE: (feet) 89.8

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

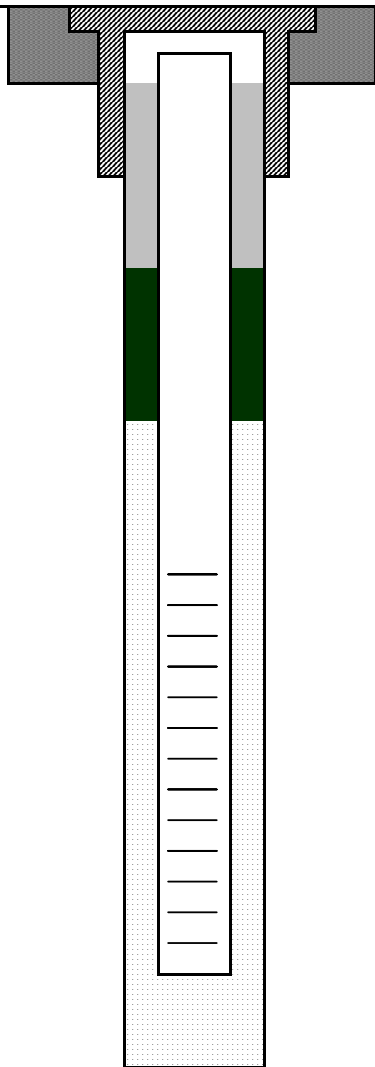
100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	SS/T 4
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	3/6/2007
Project Location:	Silver Spring, MD	Ground EL:	310.0 (feet)	Logged By:	C. Nicholson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickrete
(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickrete
(Type)

TOP OF SEAL: (feet) 82.0

SEAL CONSTRUCTION: bentonite
(Thickness & Type)

TOP OF SANDPACK: (feet) 84.6

RISER CONSTRUCTION: solid 3/4" inside dia. pvc
(Type, Diameter Material)

TOP OF SCREEN: (feet) 86.6

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc
(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 96.6

BOTTOM OF BOREHOLE: (feet) 100.0

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

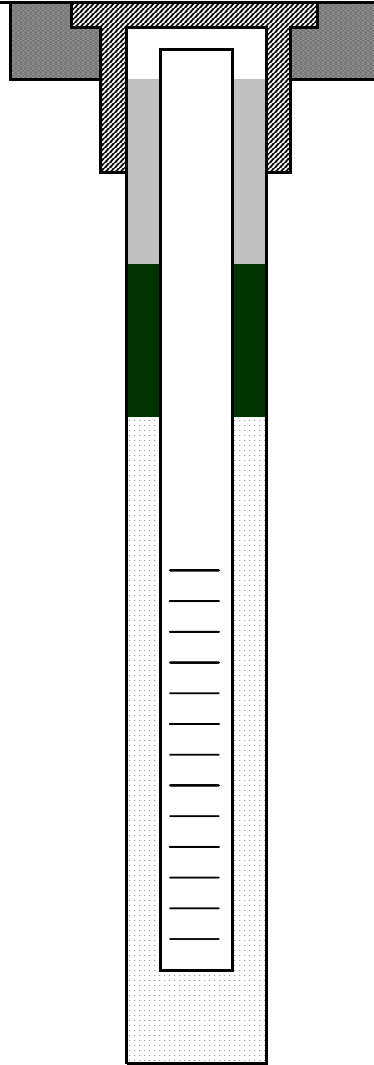
100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	SS/T 5
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	2/20/2007
Project Location:	Silver Spring, MD	Ground EL:	300.5 (feet)	Logged By:	C. Nicholson
Project Number:	18005A			Page:	1 of 1

GROUND
SURFACE

ROADWAY BOX



SURFACE SEAL: Steel flush mount cap set in quickrete

(Thickness & Type)

BACKFILL MATERIAL: bentonite and quickrete

(Type)

TOP OF SEAL: (feet) 71.0

SEAL CONSTRUCTION: bentonite

(Thickness & Type)

TOP OF SANDPACK: (feet) 73.0

RISER CONSTRUCTION: solid 3/4" inside dia. pvc

(Type, Diameter Material)

TOP OF SCREEN: (feet) 75.0

SANDPACK TYPE: #2 Silica Sand

SCREEN MATERIAL: 0.01-inch slotted 3/4" inside dia. pvc

(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: (feet) 85.0

BOTTOM OF BOREHOLE: (feet) 90.5

BOREHOLE DIAMETER: (inch) 3.0

Remarks:



Parsons
Brinckerhoff

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Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	Wayne 4
Project Name:	Purple Line	Driller:	E. Hill	Date Installed:	3/13/2007
Project Location:	Silver Spring, MD	Ground EL:	333.60 (feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	336.6 (feet)	Page:	1 of 1

	GROUND SURFACE	LOCKED PROTECTIVE CASING	SURFACE SEAL: _____ (Thickness & Type)	Steel riser casing set in quickrete
			BACKFILL MATERIAL: _____ (Type)	bentonite and quickrete
			TOP OF SEAL: _____ (feet)	85.0
			SEAL CONSTRUCTION: _____ (Thickness & Type)	bentonite
			TOP OF SANDPACK: _____ (feet)	87.3
			RISER CONSTRUCTION: _____ (Type, Diameter & Material)	solid 3/4" inside dia. pvc
			TOP OF SCREEN: _____ (feet)	89.3
			SANDPACK TYPE: _____	#2 Silica Sand
			SCREEN MATERIAL: _____ (Type, Slot, Diameter & Material)	0.01-inch slotted 3/4" inside dia. pvc
			BOTTOM OF SCREEN: _____ (feet)	99.3
			BOTTOM OF BOREHOLE: _____ (feet)	99.8
			BOREHOLE DIAMETER: _____ (inch)	3

Remarks:

Purple Line for Bi-County Transitway

Wells installed by E2CR, Inc.

Boring/ Well No. Date Installed	Manchester 2 3/28/2007			Plymouth 2 4/2/2007			Sligo 1 2/12/2007			Sligo 4 2/22/2007			Sligo 8 4/18/2007			SS/T 2 3/12/2007			SS/T 4 3/6/2007			SS/T 5 2/20/2007			Wayne 4 3/13/2007		
	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.	Casing Stick up	Ground Surface El.	Top of Casing El.
	0	263.4	263.4	-0.3	317.1	316.8	2.5	335.9	338.4	-0.25	329.3	329.05	-0.25	244.9	244.65	-0.4	328.8	328.4	-0.2	310	309.8	-0.2	300.5	300.3	2.65	333.6	336.25

Water Readings

Date	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.	Depth from top of casing	Depth from Surface	Ground Water El.
2/20/2007							28.6	26.1	309.8																		
2/28/2007							28.5	26	309.9	22.3	22.55	306.8										8.8	9	291.5			
3/5/2007							28.4	25.9	310.0	difficulty registering on indicator												10.3	10.5	290.0			
3/6/2007																			*	17.1	292.9						
3/12/2007							28.3	25.8	310.1	difficulty registering on indicator									14.4	14.6	295.4	12.4	12.6	287.9			
4/2/2007				*	22.65	294.45																					
4/2/2007	13.4	13.4	250				28	25.5	310.4							8.1	8.5	320.3	12.9	13.1	296.9	15.3	15.5	285.0			
4/9/2007		13.4	250	19.7	20.0	297.1	28.2	25.7	310.2	difficulty registering on indicator						6.2	6.6	322.2	13.9	14.1	295.9	14.5	14.7	285.8			
4/18/2007	13	13	250.4	19.5	19.8	297.3	28.3	25.8	310.1	14.9	15.15	314.2				8.1	8.5	320.3	13.1	13.3	296.7	15	15.2	285.3			
4/25/2007	12.8	12.8	250.6	19.3	19.6	297.5	27.9	25.4	310.5	15	15.25	314.1	18.8	19.1	225.6	8.1	8.5	320.3	12.5	12.7	297.3	15.1	15.3	285.2			
4/26/2007	12.8	12.8	250.6	19.4	19.7	297.4	27.9	25.4	310.5	14.8	15.05	314.3	18	18.3	226.4	6.5	6.9	321.9	13.4	13.6	296.4	15.2	15.4	285.1	19.8	17.2	316.5
5/2/2007	12.7	12.7	250.7	19.3	19.6	297.5	28	25.5	310.4	15	15.25	314.1	20.2	20.5	224.2	7.2	7.6	321.2	13.8	14.0	296.0	15.3	15.5	285.0	19.8	17.2	316.5
5/7/2007	13	13.0	250.4	19.5	19.8	297.3	28.1	25.6	310.3	14.9	15.2	314.2	21	21.3	223.4	8.3	8.7	320.1	14.3	14.5	295.5	15.3	15.5	285.0	19.9	17.3	316.4
5/10/2007	12.8	12.8	250.6	19.5	19.8	297.3	28.1	25.6	310.3	15	15.3	314.1	21.5	21.8	222.9	car blocking access			14.5	14.7	295.3	15.4	15.6	284.9	19.8	17.2	316.5
5/21/2007	13.3	13.3	250.1	19.8	20.1	297.0	28.2	25.7	310.2	14.6	14.9	314.5	22.8	23.1	221.6	8.2	8.6	320.2	15.2	15.4	294.6	15.6	15.8	284.7	20.2	17.6	316.1
6/2/2007	13.7	13.7	249.7	20.3	20.6	296.5	28.4	25.9	310.0	14.6	14.9	314.5	24.1	24.4	220.3	car blocking access			16	16.2	293.8	15.8	16.0	284.5	20.6	18.0	315.7
6/6/2007	13.9	13.9	249.5	20.5	20.8	296.3	28.4	25.9	310.0	14.7	15.0	314.4	24.4	24.7	220.0	8.4	8.8	320.0	16.1	16.3	293.7	16	16.2	284.3	20.6	18.0	315.7
6/14/2007	14.3	14.3	249.1	21	21.3	295.8	28.4	25.9	310.0	14.8	15.1	314.3	25.2	25.5	219.2	8.3	8.7	320.1	16.2	16.4	293.6	15.8	16.0	284.5	20.9	18.3	315.4
7/10/2007	15.3	15.3	248.1	22.6	22.9	294.2	28.65	26.2	309.8	construction obstructing access			27.4	27.7	217.0	6.07	6.5	322.3	17.68	17.9	292.1	16.4	16.6	283.9	21.66	19.0	314.6
7/18/2007	15.7	15.7	247.7	23.3	23.6	293.5	28.8	26.3	309.6	11.3	11.6	317.8	27.9	28.2	216.5	8.8	9.2	319.6	18.1	18.3	291.7	16.8	17.0	283.5	22	19.4	314.3

* Depth measured while drilling. See boring and coring logs for details.



Appendix N

Silver Spring Soil Laboratory

Test Data

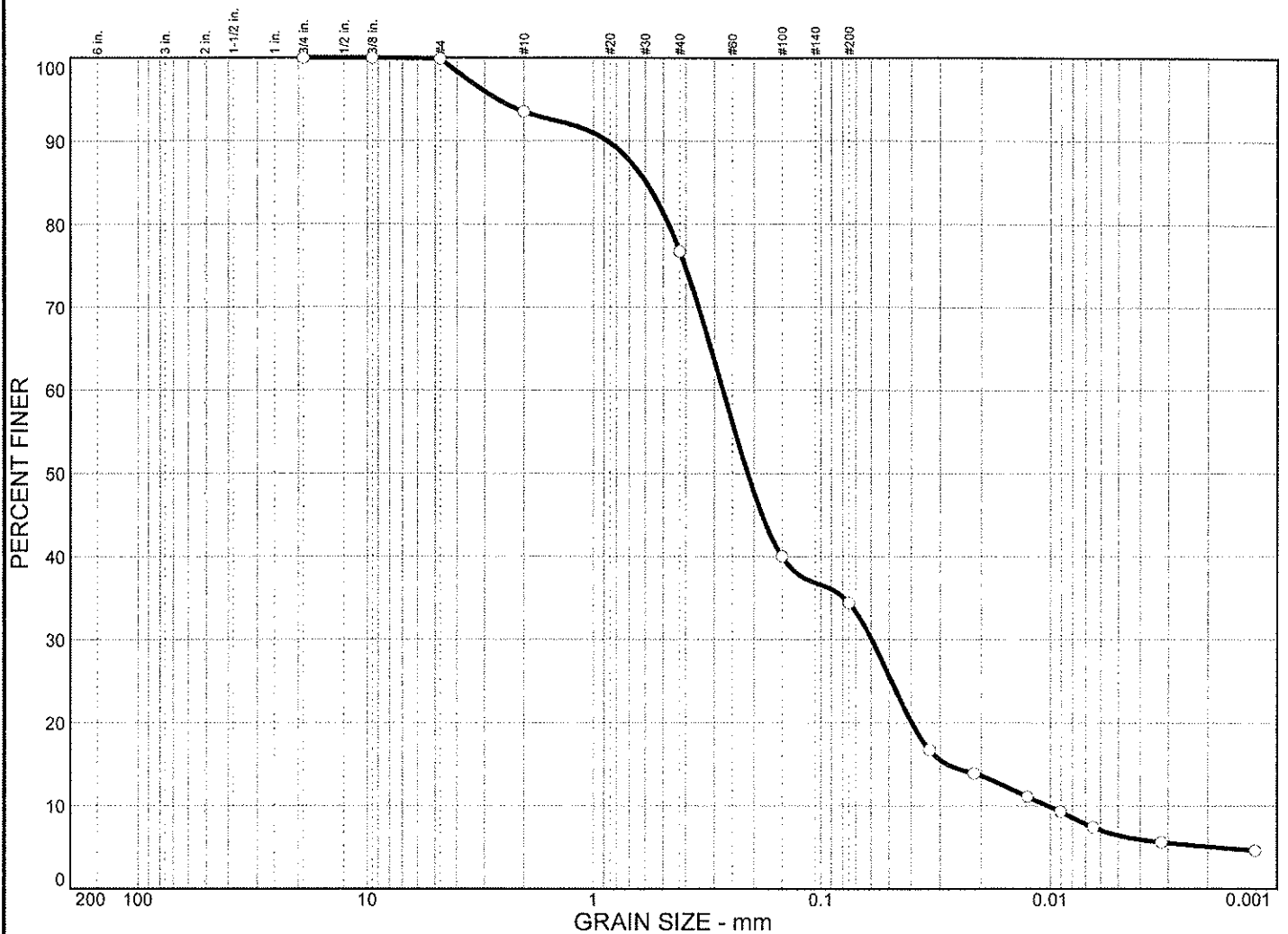
Grain size distribution curve for a sample of sand. The Y-axis represents Percent Finer (0 to 100), and the X-axis represents Grain Size in mm (logarithmic scale from 200 to 0.001). The curve is labeled with sieve numbers and corresponding sieve sizes in inches.

Sieve Number	Sieve Size (in.)	Grain Size (mm)	Percent Finer (%)
3/4	0.75	19.0	100
1/2	0.50	12.5	100
3/8	0.375	9.5	100
#4	0.25	7.5	98
#10	0.15	4.75	87
#20	0.075	2.5	65
#30	0.06	2.0	55
#40	0.0475	1.5	45
#60	0.025	0.85	35
#100	0.015	0.6	34
#140	0.0106	0.425	14
#200	0.0075	0.3	12
		0.25	10
		0.15	8
		0.106	6
		0.075	5
		0.05	4
		0.03	3
		0.02	2
		0.015	1
		0.01	0

[illegible]

Project No. 07503-04	Client: Mayland Transit Administration	Remarks: ○ Natural Moisture = 7.9%
Project: Purple Line		
○ Source: Manchester - 1	Sample No.: S-2 Elev./Depth: 2.0' - 4.0'	
Particle Size Distribution Report E2CR, Inc.		Figure

Particle Size Distribution Report

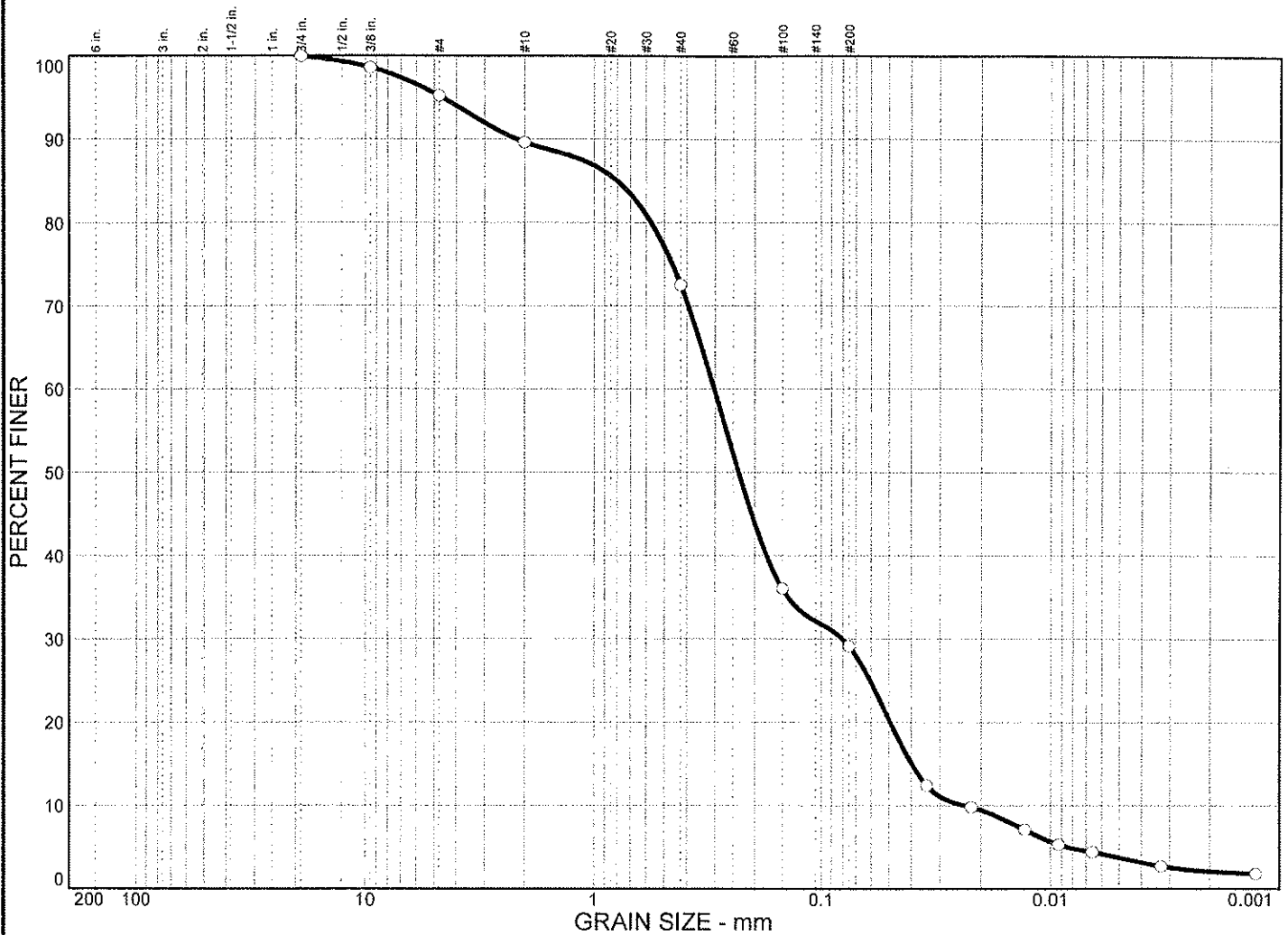


	% COBBLES	% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	0.1		65.5				28.0		6.4	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	0.593	0.275	0.213	0.0596	0.0280	0.0103	1.26	26.73	

MATERIAL DESCRIPTION								USCS	AASHTO
Light Brown, Micaceous, Silty F-C SAND, trace Clay.								SM	

Project No. 07503-04 Project: Purple Line	Client: Mayland Transit Administration	Remarks: ○ Natural Moisture = 8.3%
○ Source: Manchester - 1	Sample No.: S-3 & S-4	
Elev./Depth: 4.0' - 8.0'		
Particle Size Distribution Report E2CR, Inc.		Figure

Particle Size Distribution Report



	% COBBLES	% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	4.8		66.1				25.4		3.7	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	0.800	0.303	0.236	0.0804	0.0397	0.0235	0.91	12.87	

MATERIAL DESCRIPTION								USCS	AASHTO
Light Grayish Brown, Micaceous, Silty F-C SAND.								SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Manchester - 1 Sample No.: S-6 & S-7 Elev./Depth: 13.5' -20.0'	Remarks: Natural Moisture = 6.7%
Particle Size Distribution Report E2CR, Inc.	

Figure

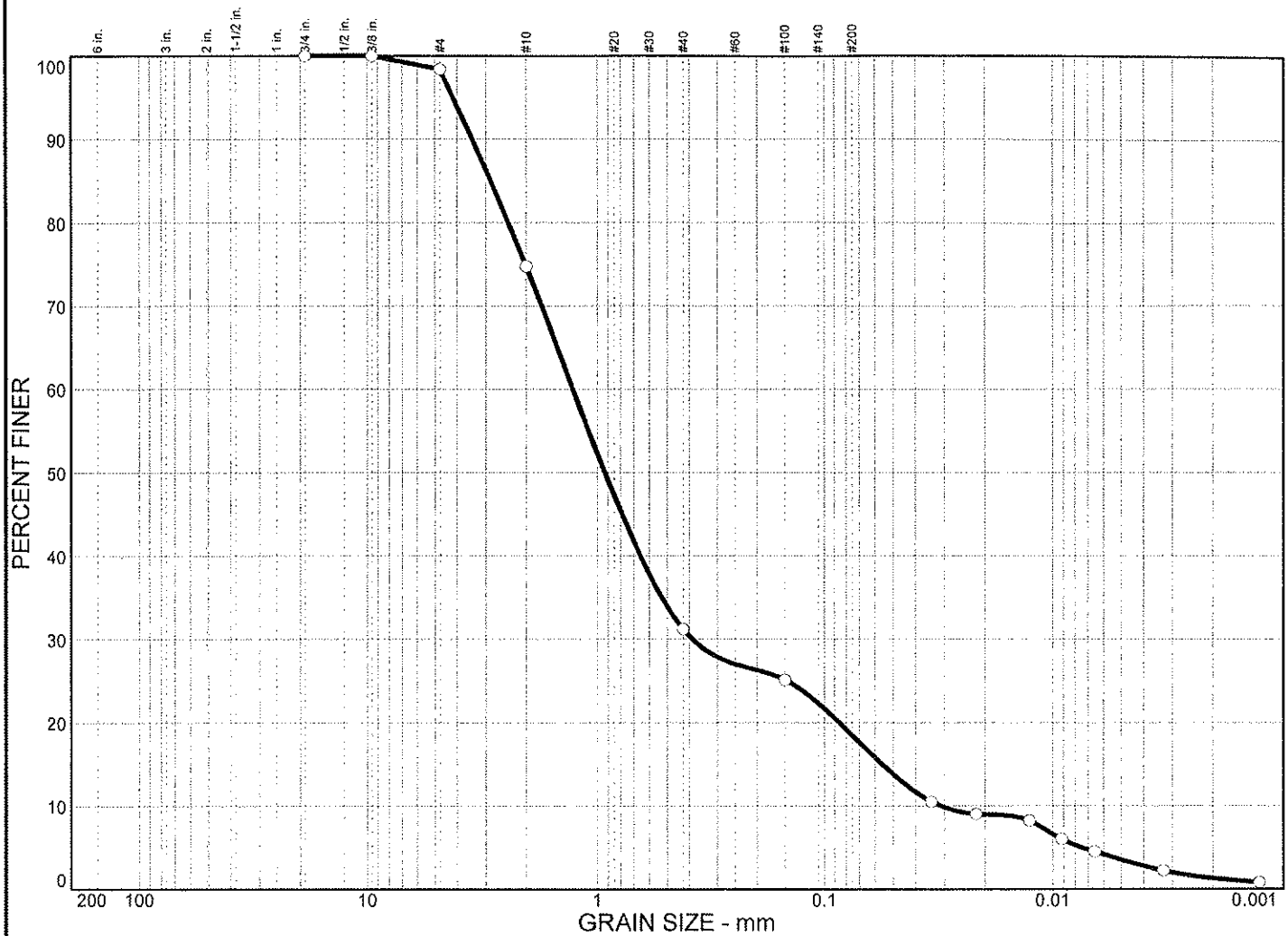
The graph shows a grain size distribution curve for a soil sample. The Y-axis represents the Percent Finer, ranging from 0 to 100. The X-axis represents the Grain Size in mm, on a logarithmic scale from 200 to 0.001. The curve is smooth and passes through several standard sieve sizes, including 4.75 mm, 2.0 mm, 0.85 mm, 0.425 mm, 0.25 mm, 0.15 mm, 0.075 mm, and 0.0425 mm. The curve indicates that approximately 100% of the soil is finer than 4.75 mm, and about 32% is finer than 0.075 mm.

Grain Size (mm)	Percent Finer (%)
200	100
100	100
4.75	100
2.0	100
0.85	100
0.425	100
0.25	100
0.15	100
0.075	32
0.0425	27
0.025	13
0.015	9
0.0075	6
0.00425	4
0.0025	2
0.001	0

MATERIAL DESCRIPTION	USCS	AASHTO
○ Grayish Brown, Light Brown, Micaceous, Silty F-C SAND.	SM	

Figure

Particle Size Distribution Report



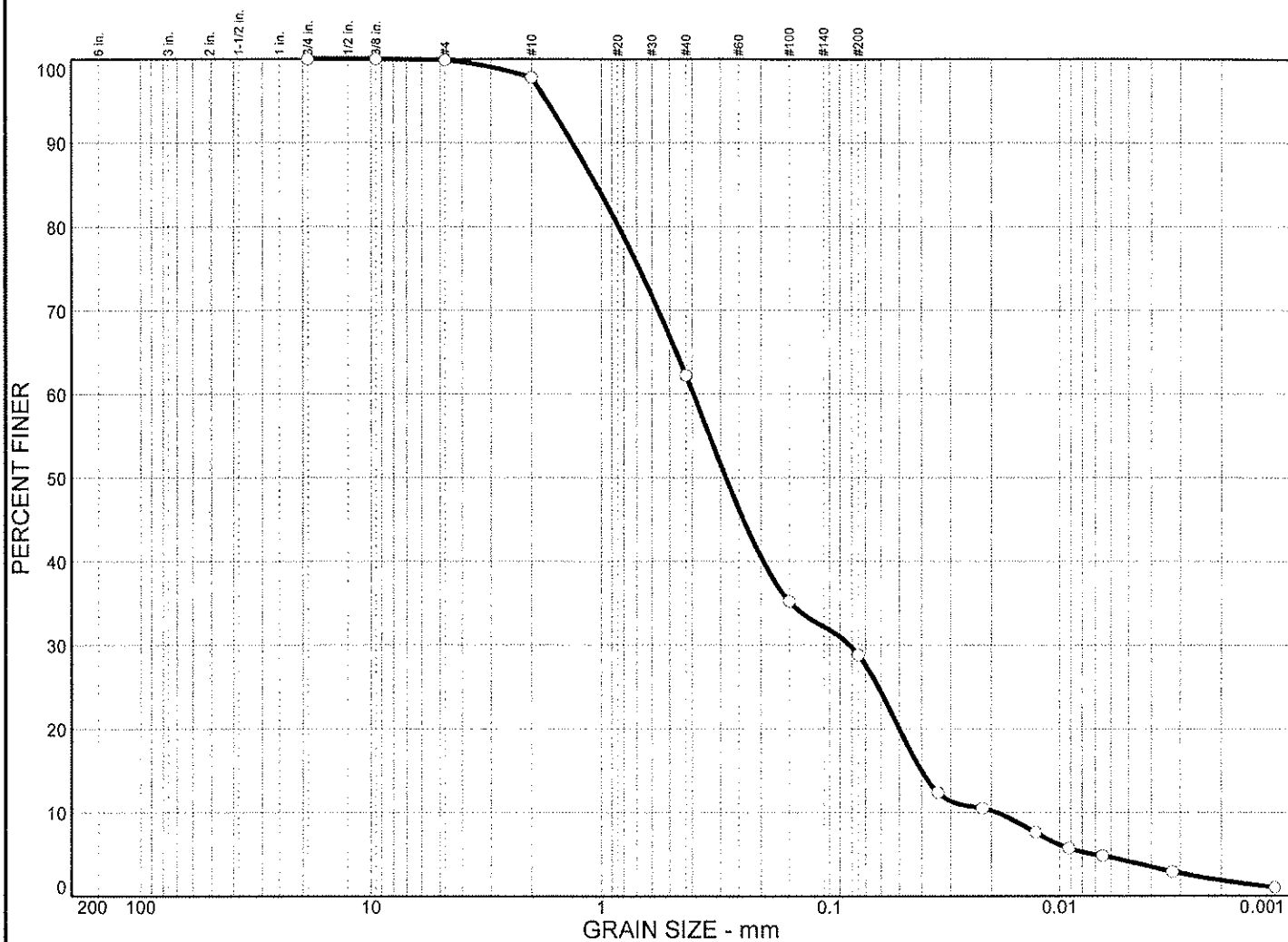
% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
0.0		1.6		80.0				14.9		3.5	
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u		
NP	NP	2.86	1.27	0.928	0.387	0.0558	0.0313	3.78	40.54		

MATERIAL DESCRIPTION								USCS	AASHTO
Grayish Brown, Micaceous, Silty F-C SAND .								SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Manchester - 2 Sample No.: S-5 & S-6 Elev./Depth: 6.0' - 10.0'	Remarks: Natural Moisture = 9.9%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



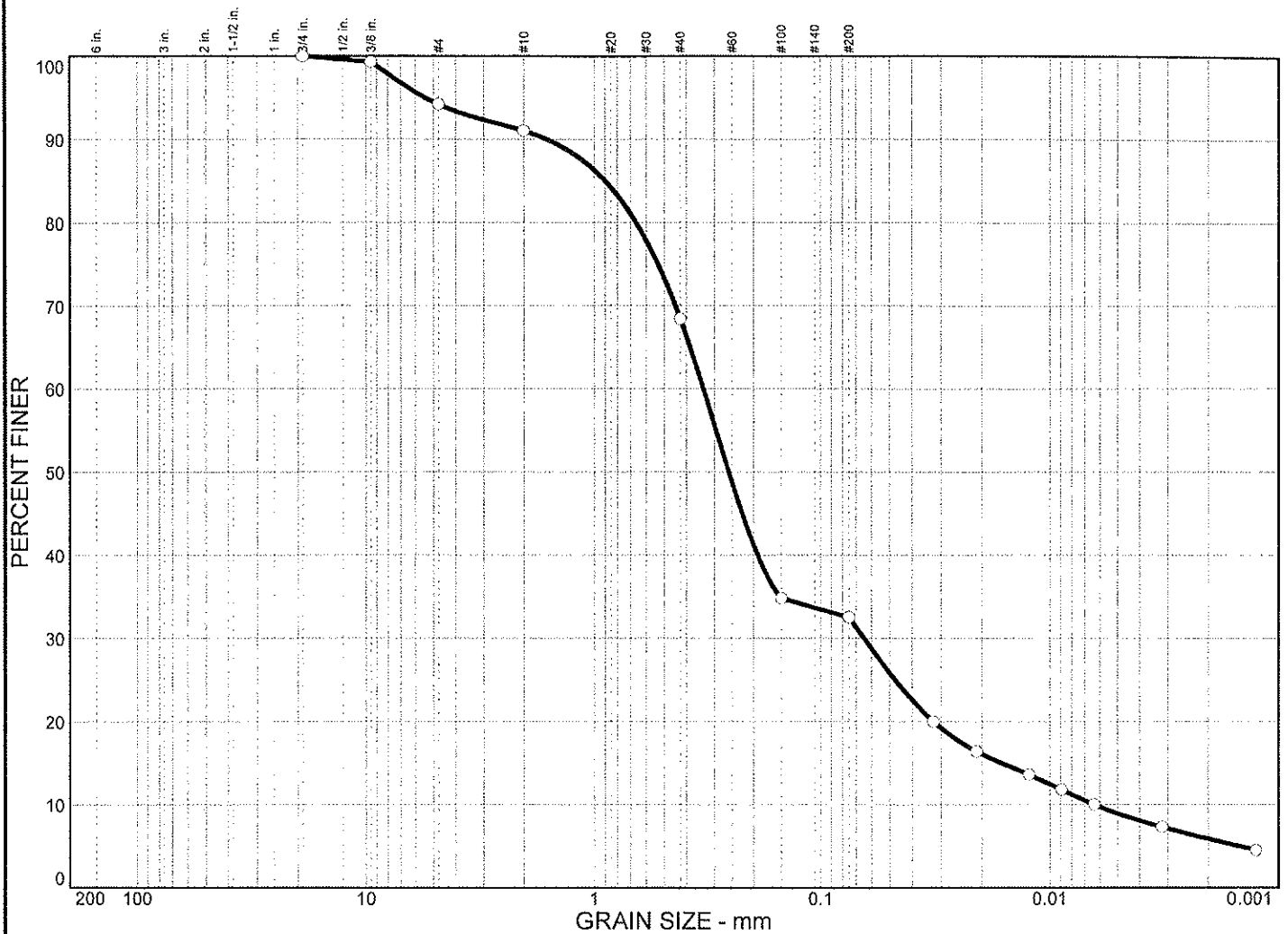
	% COBBLES	% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	0.1		71.1				24.7		4.1	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	1.05	0.395	0.284	0.0819	0.0400	0.0189	0.90	20.84	

MATERIAL DESCRIPTION	USCS	AASHTO
Light Brown, Micaceous, Silty F-M SAND	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Manchester - 4 Sample No.: S-6 & S-7 & S-Elev./Depth: 13.5' - 25.0'	Remarks: Natural Moisture = 7.6%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	5.8		61.7				23.6		8.9	
✗	LL	PL	D85	D60	D50	D30	D15	D10	C _c	C _u	
○	37	33	0.900	0.336	0.258	0.0646	0.0164	0.0064	1.96	52.88	
MATERIAL DESCRIPTION									USCS	AASHTO	
○ Brown, Micaceous, Silty F-M SAND , Trace Clay & Fine Gravel,									SM		

Project No. 07503-04 Client: Mayland Transit Administration

Project: Purple Line

Source: Plymouth - 1

Sample No.: S-3 & S-4

Elev./Depth: 4.0' - 8.0'

Remarks:

Natural Moisture = 14.4%

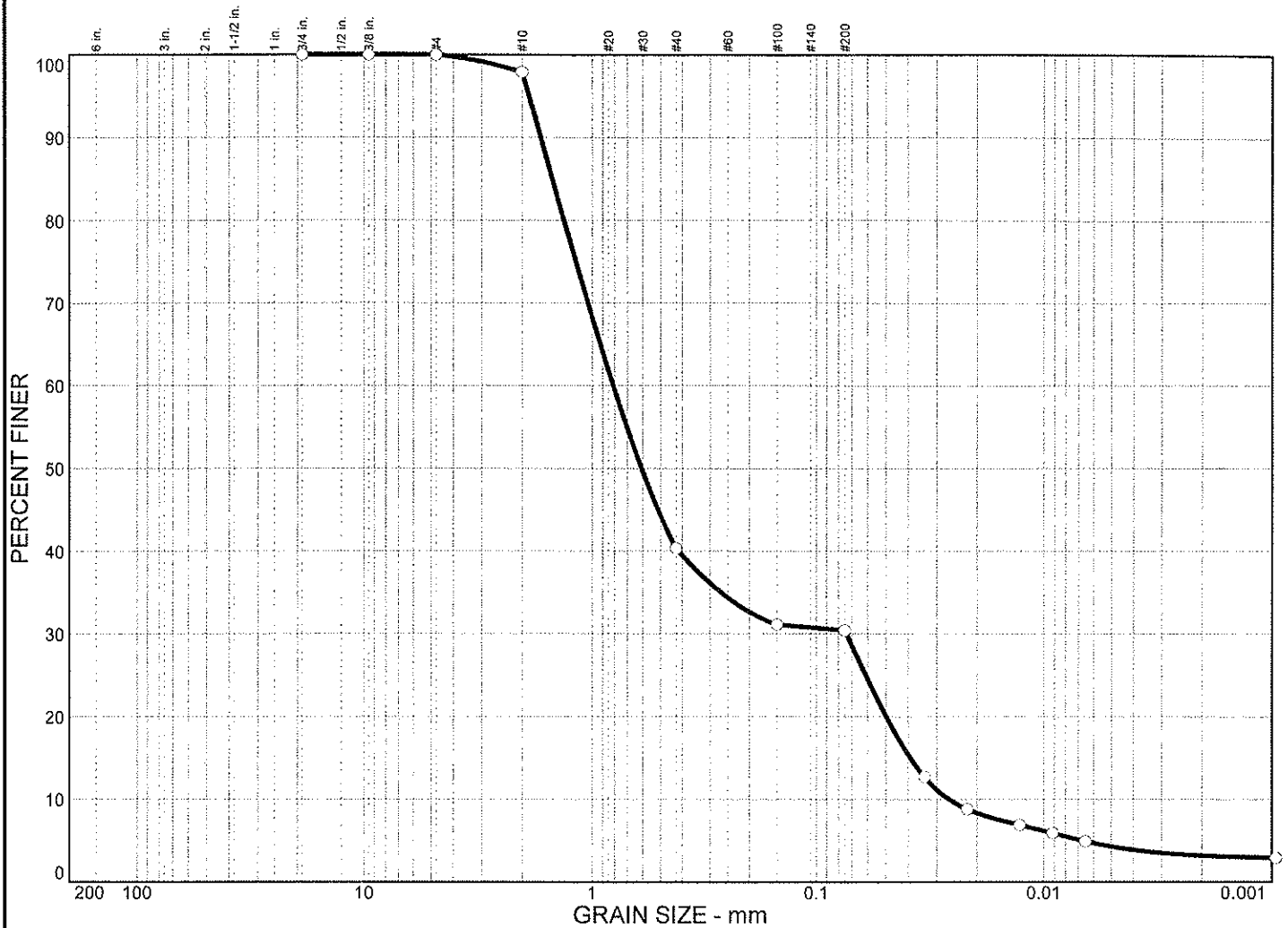
PI : 4.0


Particle Size Distribution Report

E2CR, Inc.

Figure

Particle Size Distribution Report



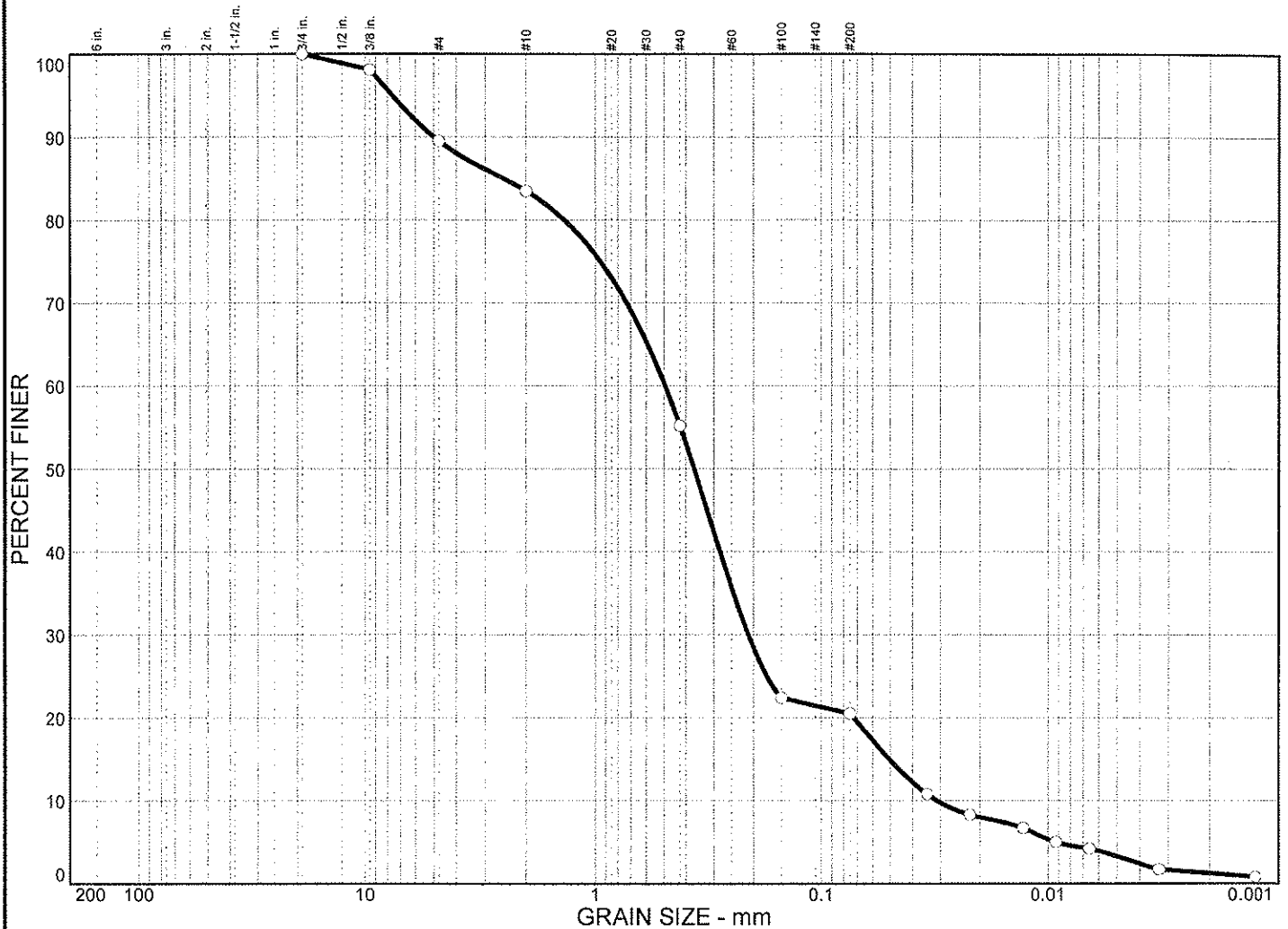
% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	0.0		69.6				26.1		4.3	
											
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	1.49	0.809	0.607	0.0739	0.0391	0.0265	0.25	30.57	

MATERIAL DESCRIPTION								USCS	AASHTO
○ Light Brown, Micaceous, Silty F-M SAND.								SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Plymouth - 1 Sample No.: S-7 Elev./Depth: 18.5' - 20.0'	Remarks: ○ Natural Moisture = 11.0%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
0.0	10.5		69.0				17.2		3.3		
X	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu	
0	NP	NP	2.50	0.494	0.367	0.210	0.0505	0.0310	2.88	15.92	
MATERIAL DESCRIPTION								USCS	AASHTO		
0 Light Gray, Micaceous, Silty F-C SAND, Little Fine Gravel.								SM			

Project No. 07503-04 Client: Mayland Transit Administration

Project: Purple Line

Source: Plymouth - 1

Sample No.: S-9 & S-10 Elev./Depth: 28.5' - 35.0'

Remarks:

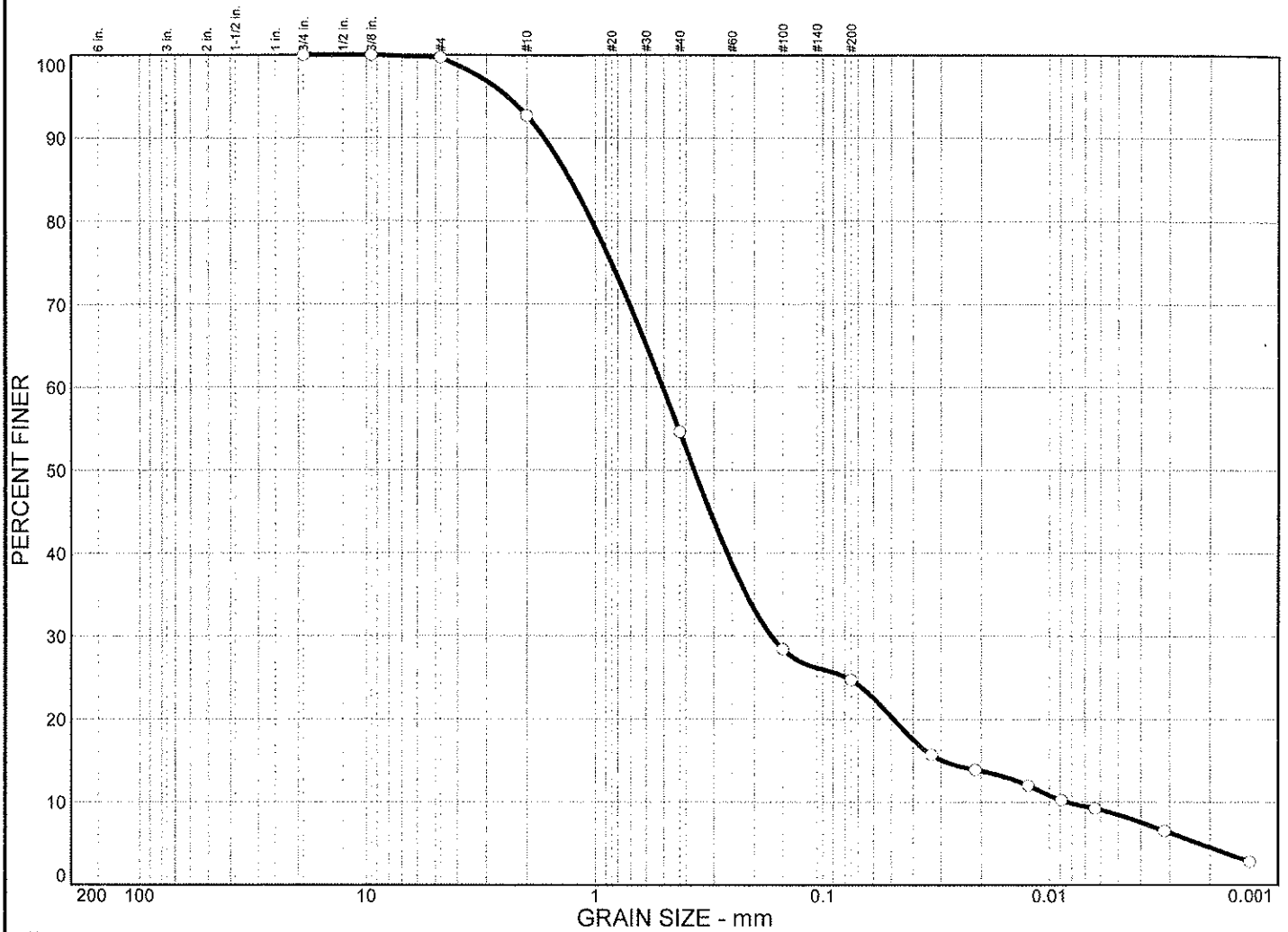
Natural Moisture = 5.7%

Particle Size Distribution Report

E2CR, Inc.

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.3	75.0	16.3	8.4

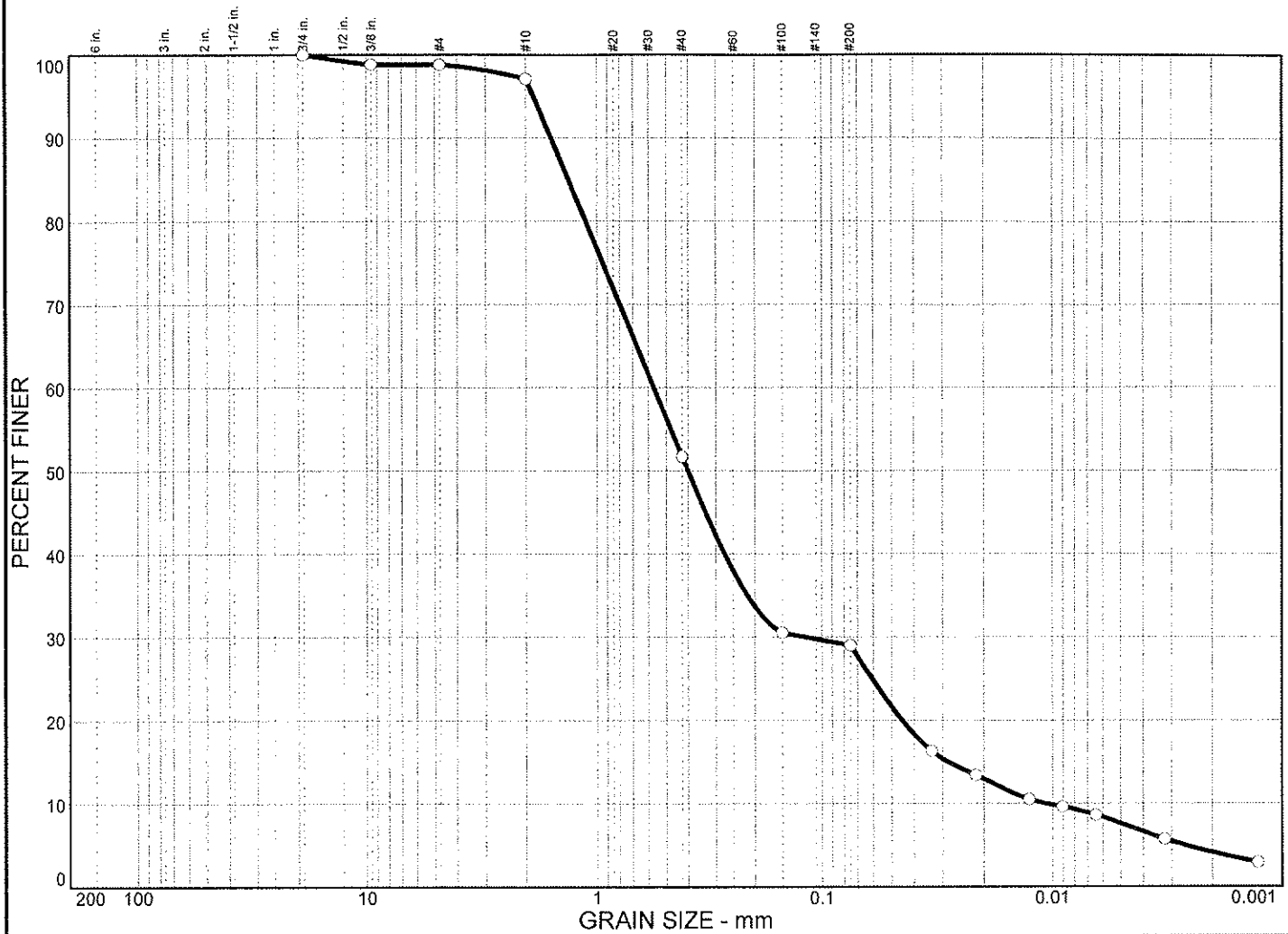
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
35	30	1.29	0.506	0.367	0.168	0.0297	0.0084	6.64	60.00

MATERIAL DESCRIPTION	USCS	AASHTO
○ Light Brown, Micaceous, Silty F-M SAND, Trace Clay.	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line ○ Source: Plymouth - 2 Sample No.: S-6 Elev./Depth: 13.5' - 15.0'	Remarks: ○ Natural Moisture = 10.4% PI : 5.0
<div>Particle Size Distribution Report</div> <div>E2CR, Inc.</div>	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.2	69.8	21.4	7.6

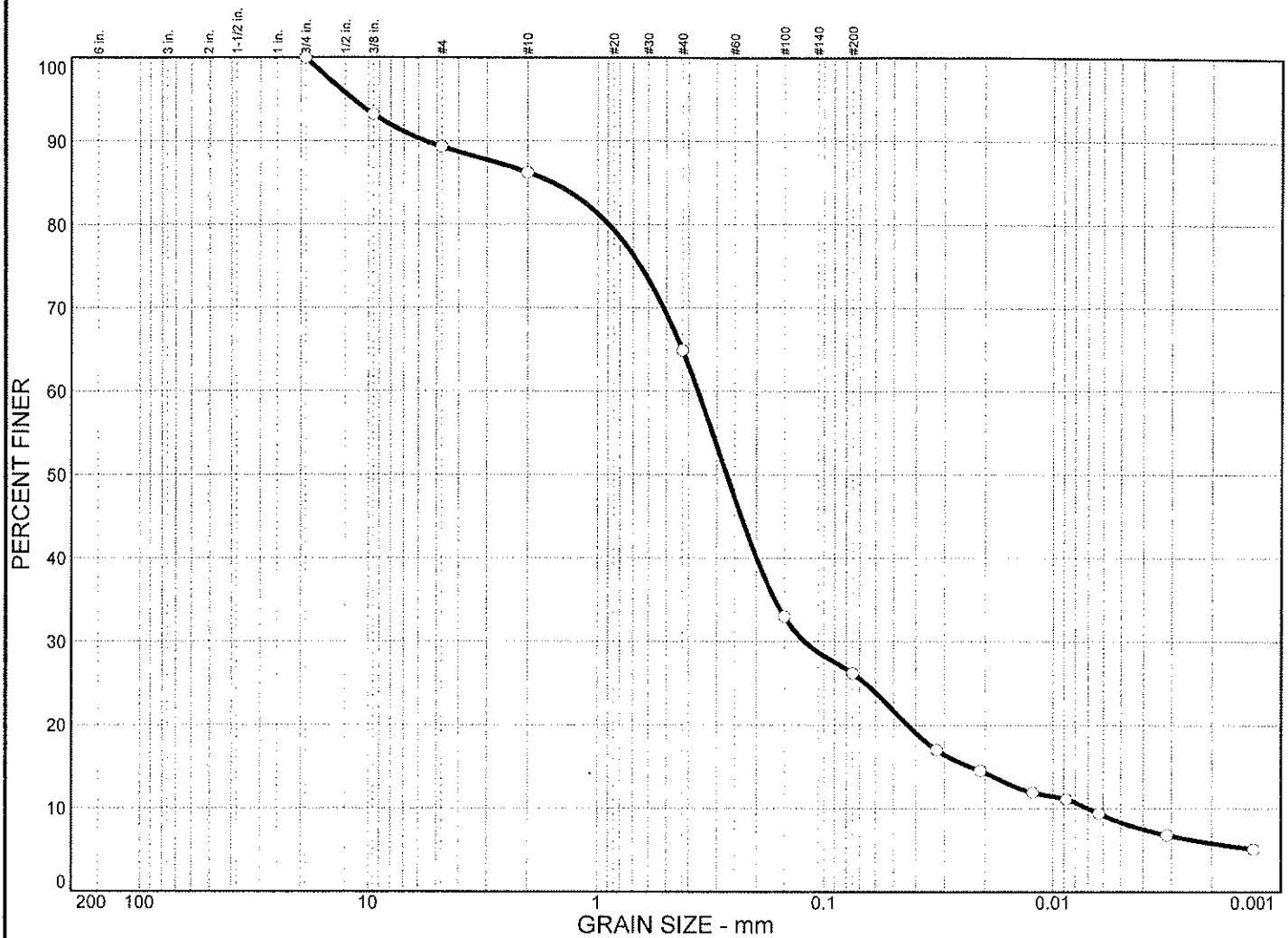
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NP	NP	1.32	0.567	0.400	0.119	0.0285	0.0108	2.32	52.64

MATERIAL DESCRIPTION	USCS	AASHTO
Grayish Brown, Micaceous, Silty F-M SAND, Trace Clay.	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line		Remarks: ○ Natural Moisture = 12.2%
Source: Plymouth - 2 Sample No.: S-9 Elev./Depth: 25.0' - 28.5'		
Particle Size Distribution Report E2CR, Inc.		

Figure

Particle Size Distribution Report



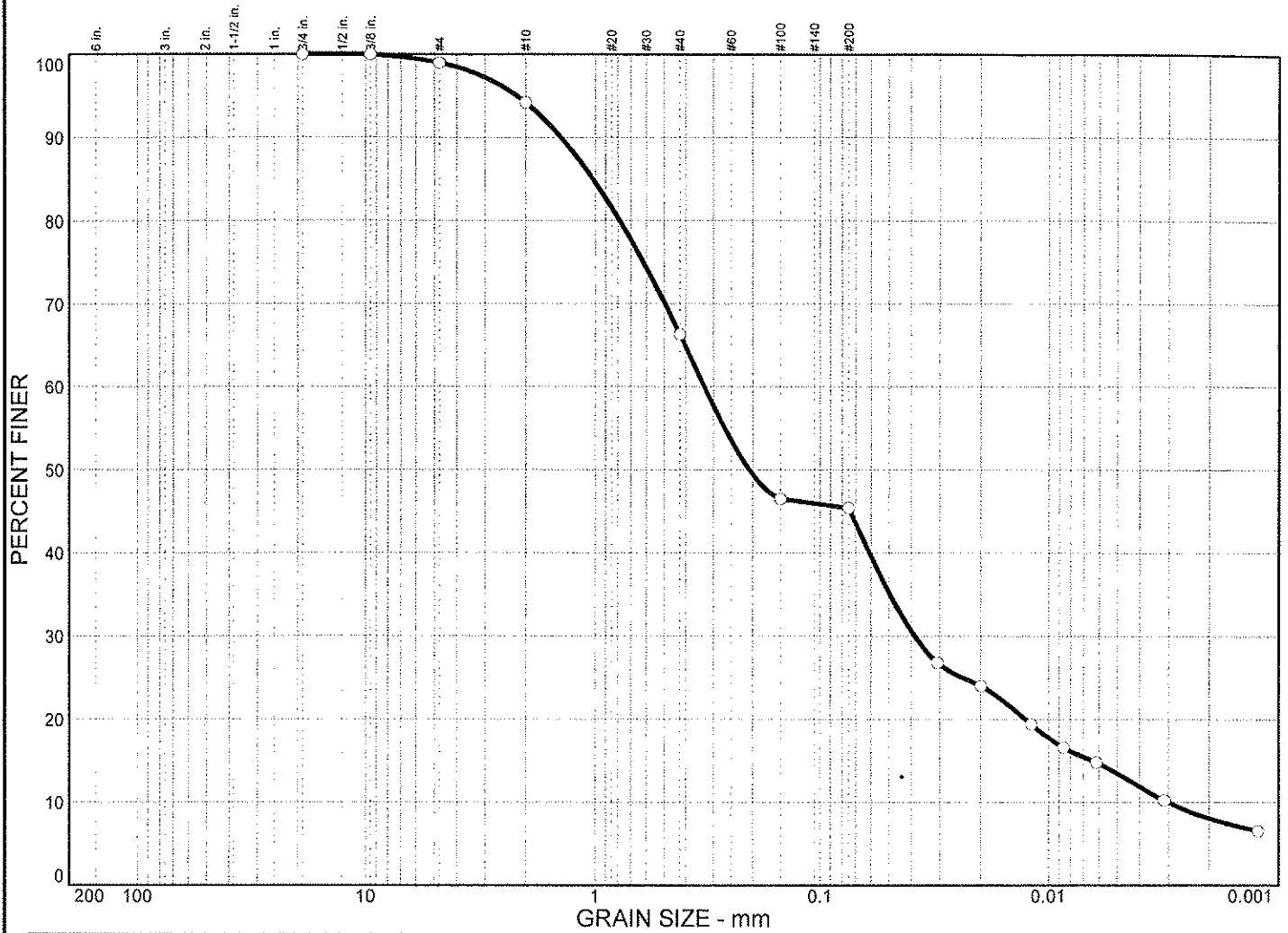
% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
0.0		10.7		63.1				17.9		8.3	
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u		
NP	NP	1.57	0.363	0.271	0.122	0.0232	0.0070	5.86	51.93		

MATERIAL DESCRIPTION								USCS	AASHTO
○ Light Gray, Micaceous, Silty F-M SAND, Little Fine Gravel, Trace Clay.								SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Plymouth - 2 Sample No.: S-10 Elev./Depth: 28.5' - 30.0'	Remarks: ○ Natural Moisture = 3.9%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report

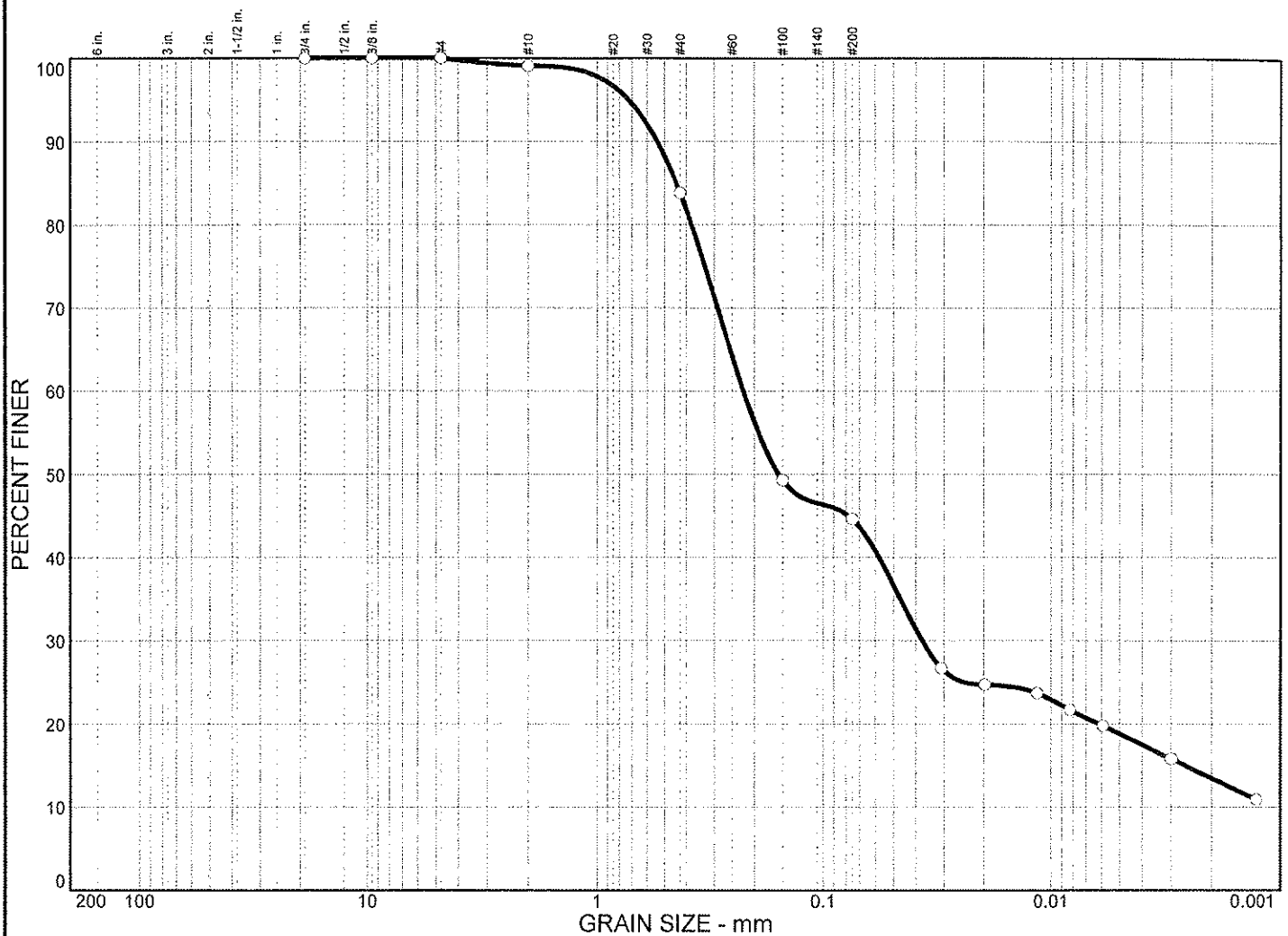


% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
○	0.0	1.0		53.6				31.9		13.5	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	47	40	1.03	0.330	0.207	0.0386	0.0064	0.0030	1.50	109.46	
MATERIAL DESCRIPTION									USCS	AASHTO	
○ Light Brown, Micaceous, Silty F-M SAND, Little Clay.									SM		

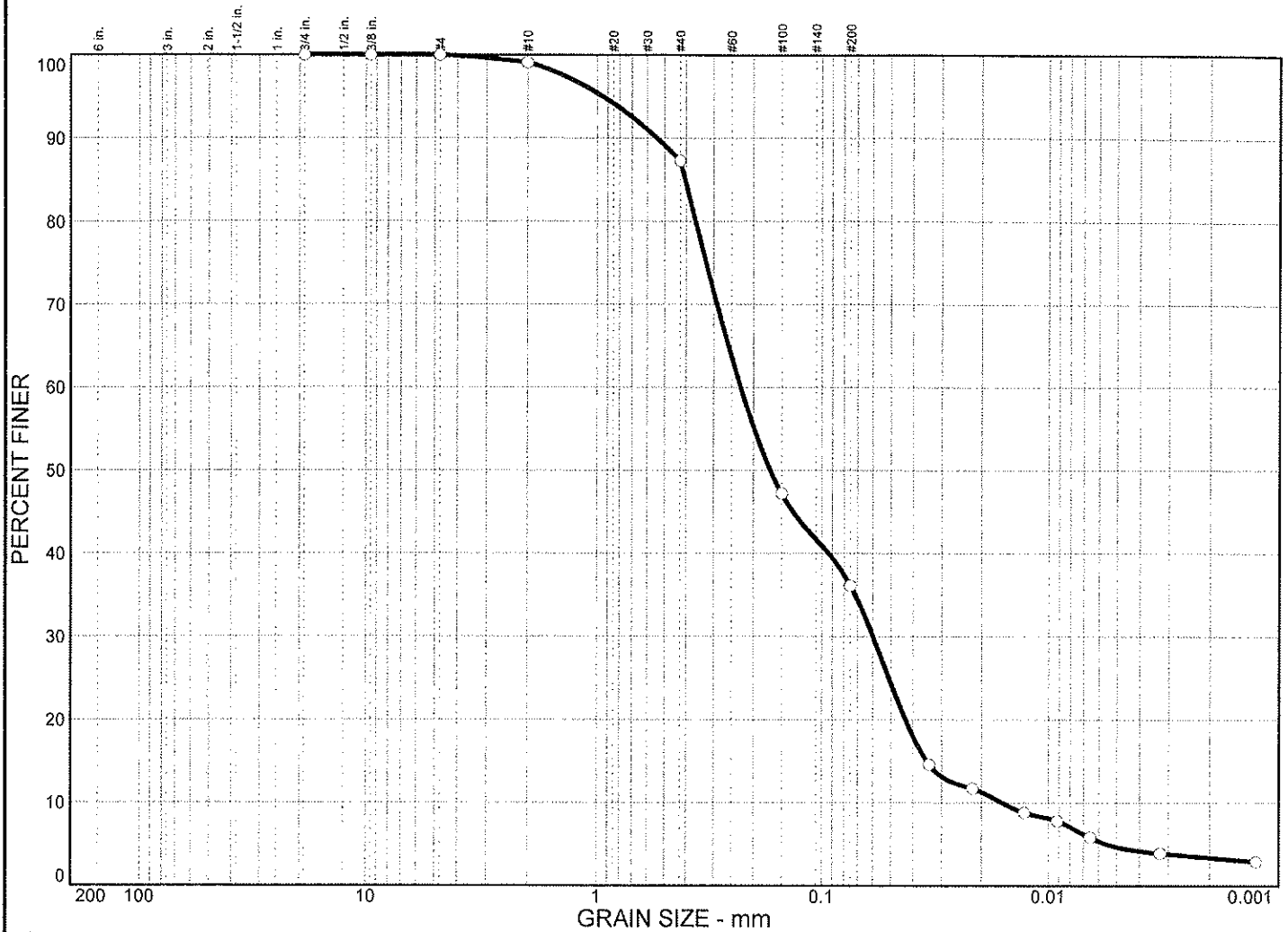
Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Plymouth - 3 Sample No.: S-3 Elev./Depth: 5.0' - 7.0'		Remarks: Natural Moisture = 18% PI : 7.0
Particle Size Distribution Report E2CR, Inc.		

Figure

Particle Size Distribution Report



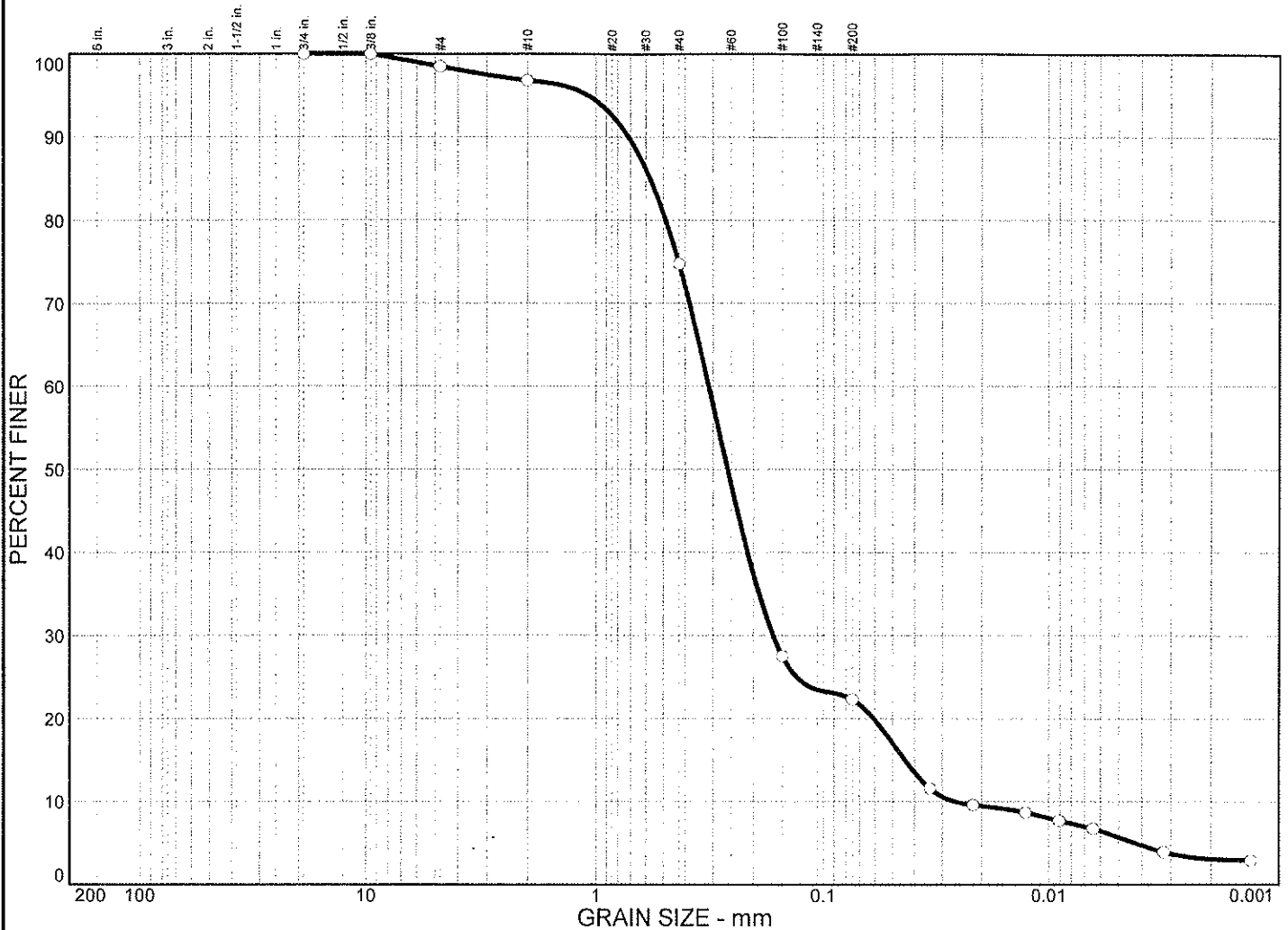
Particle Size Distribution Report



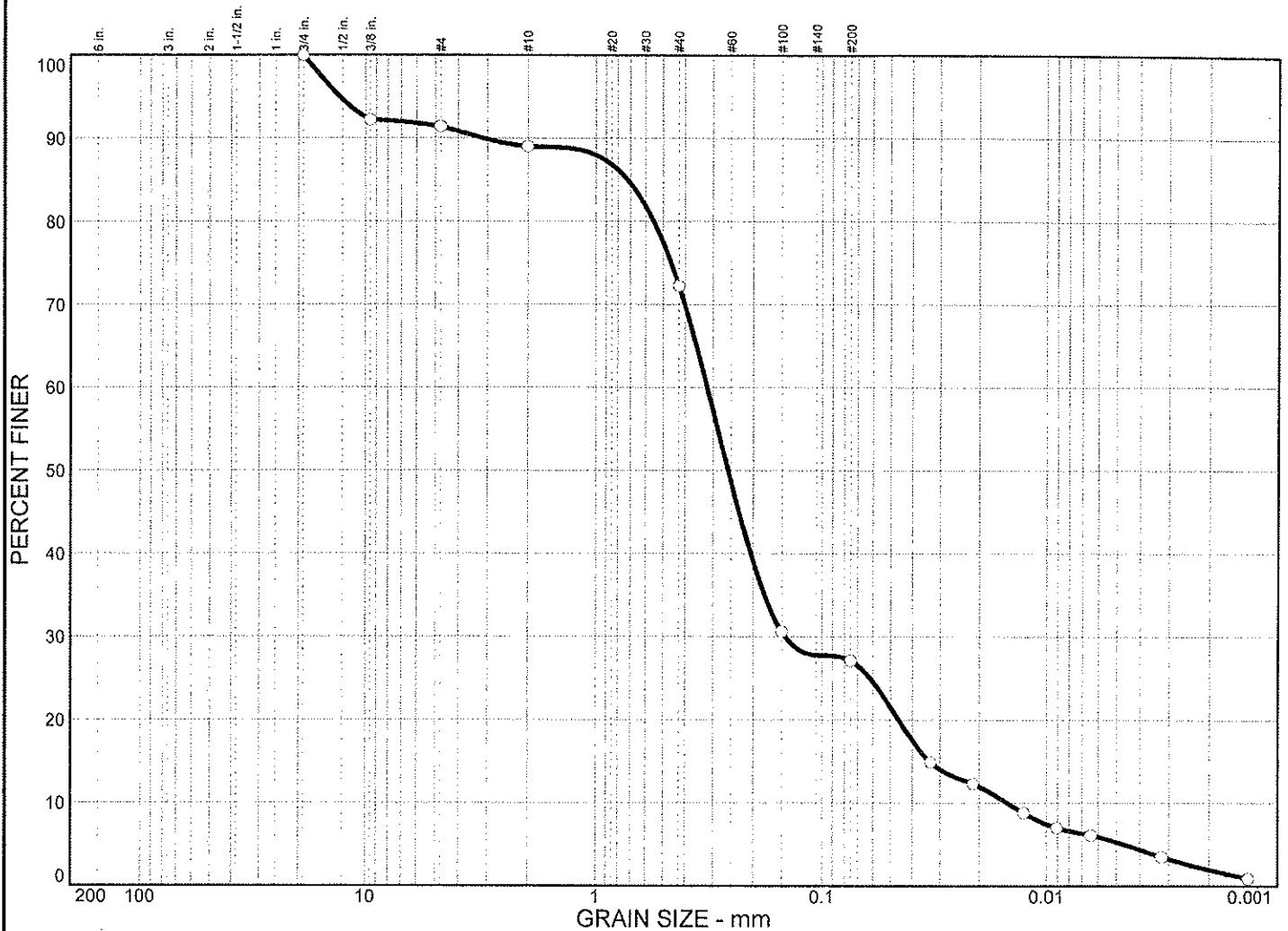
	% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0		0.0		63.9			31.4		4.7	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	NP	NP	0.404	0.227	0.168	0.0598	0.0348	0.0162	0.98	14.08	
MATERIAL DESCRIPTION									USCS		AASHTO
○ Light Brown, Micaceous, Silty F-M SAND.									SM		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line			Remarks: ○ Natural Moisture = 16.0%
○ Source: Plymouth - 3 Sample No.: S-9 Elev./Depth: 28.5' - 30.0'			
Particle Size Distribution Report E2CR, Inc.			Figure

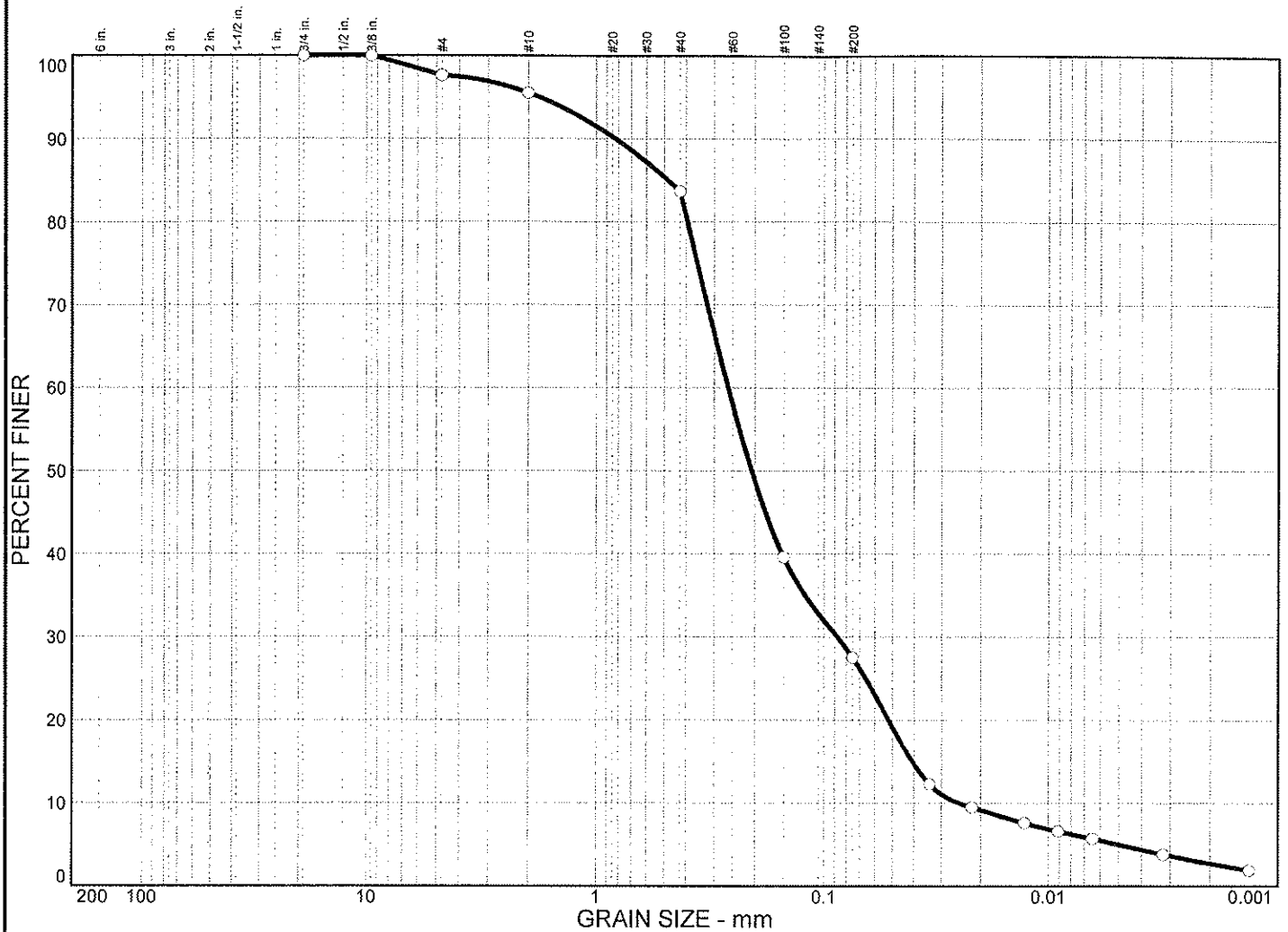
Particle Size Distribution Report



Particle Size Distribution Report



Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.4	70.1	22.5	5.0

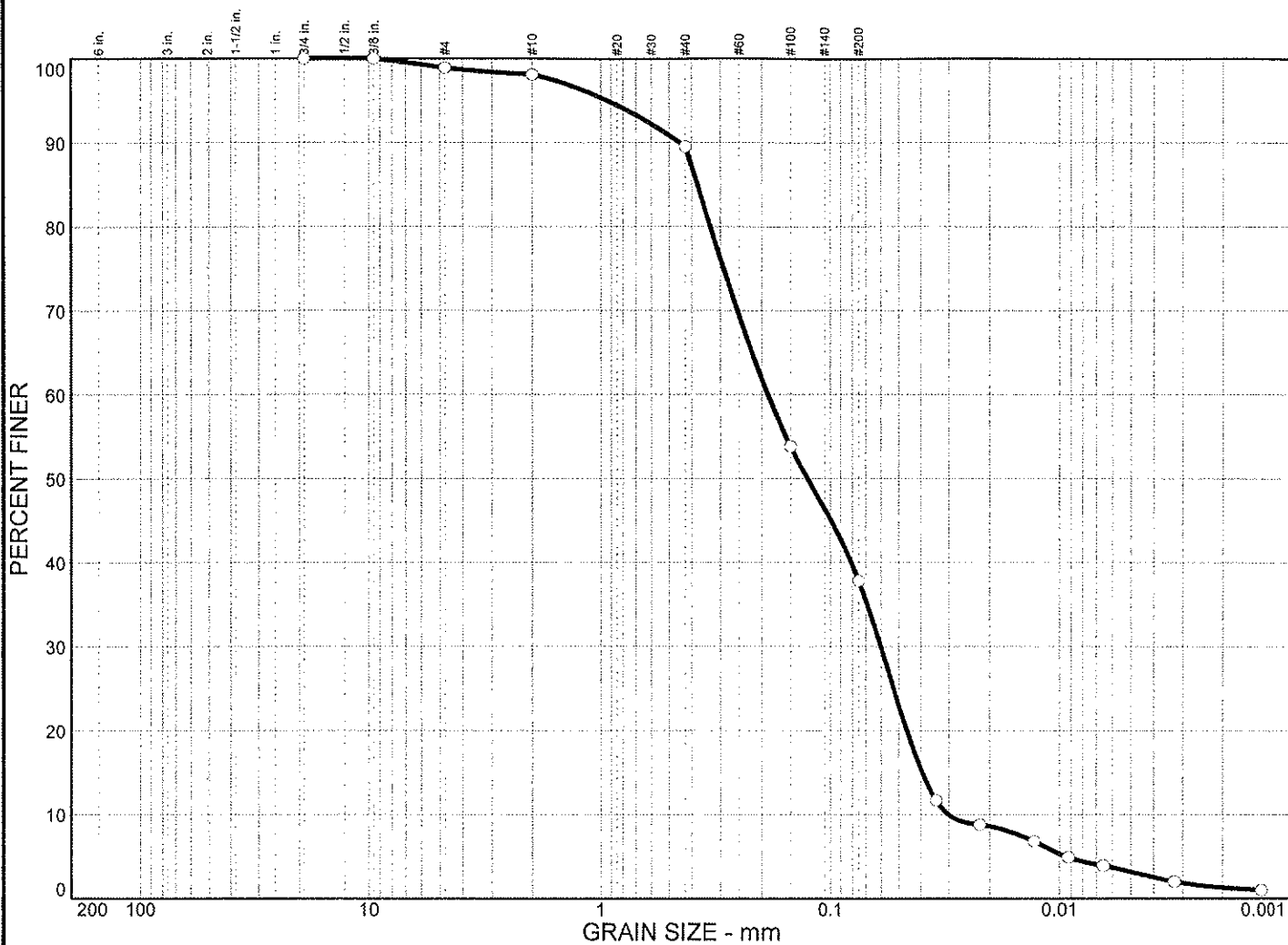
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NP	NP	0.480	0.261	0.206	0.0876	0.0406	0.0250	1.18	10.44

MATERIAL DESCRIPTION	USCS	AASHTO
Grayish Brown, Micaceous, Silty F-M SAND, Trace Clay.	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: SS/T - 1 Sample No.: S-10 Elev./Depth: 33.5' - 35.0'	Remarks: Natural Moisture = 8.5%
Particle Size Distribution Report E2CR, Inc.	

Figure

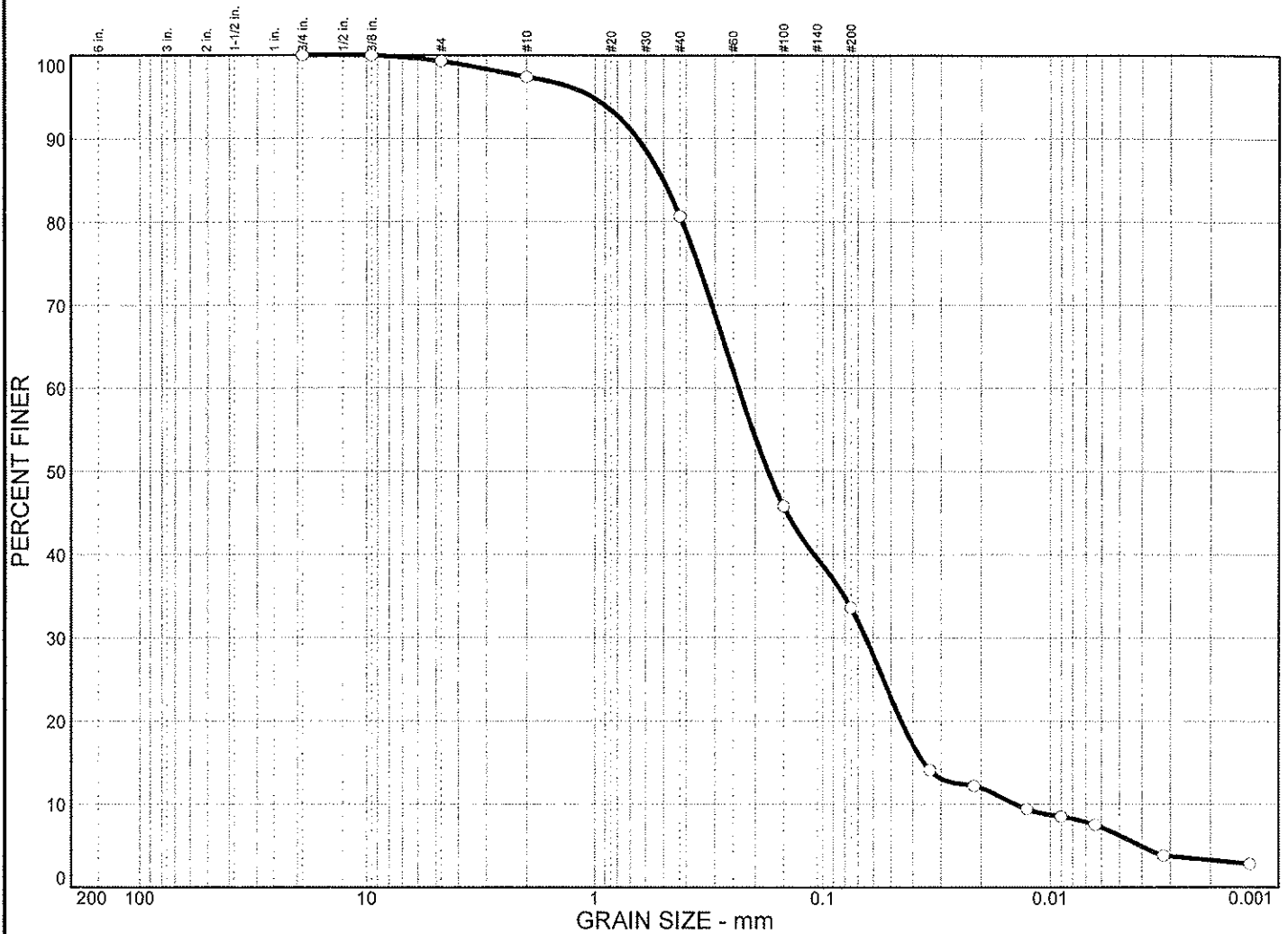
Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
0.0		1.1		61.1			34.6		3.2	
LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu	
NP	NP	0.378	0.188	0.127	0.0601	0.0394	0.0301	0.64	6.24	
MATERIAL DESCRIPTION								USCS	AASHTO	
Light Brown, Micaceous, Silty F-M SAND.								SM		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: SS/T - 2 Sample No.: S-5 & S-6 Elev./Depth: 9.0' - 15.0'	Remarks: ○ Natural Moisture = 15.6%
Particle Size Distribution Report E2CR, Inc.	
Figure	

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.7	65.7	27.4	6.2

LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NP	NP	0.503	0.236	0.175	0.0647	0.0357	0.0142	1.25	16.62

MATERIAL DESCRIPTION	USCS	AASHTO
Grayish Brown, Micaceous, Silty F-M SAND, Trace Clay.	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: SS/T - 2 Sample No.: S-7,S-8,S-9 Elev./Depth: 18.5' - 30.0'	Remarks: ○ Natural Moisture = 10.8%
Particle Size Distribution Report E2CR, Inc.	

Figure

Grain size distribution curve for a soil sample. The Y-axis represents Percent Finer (0 to 100), and the X-axis represents Grain Size in mm (logarithmic scale from 200 to 0.001). The curve shows a well-graded soil with a maximum grain size of approximately 4.75 mm (No. 10 sieve) and a minimum grain size of approximately 0.075 mm (No. 200 sieve).

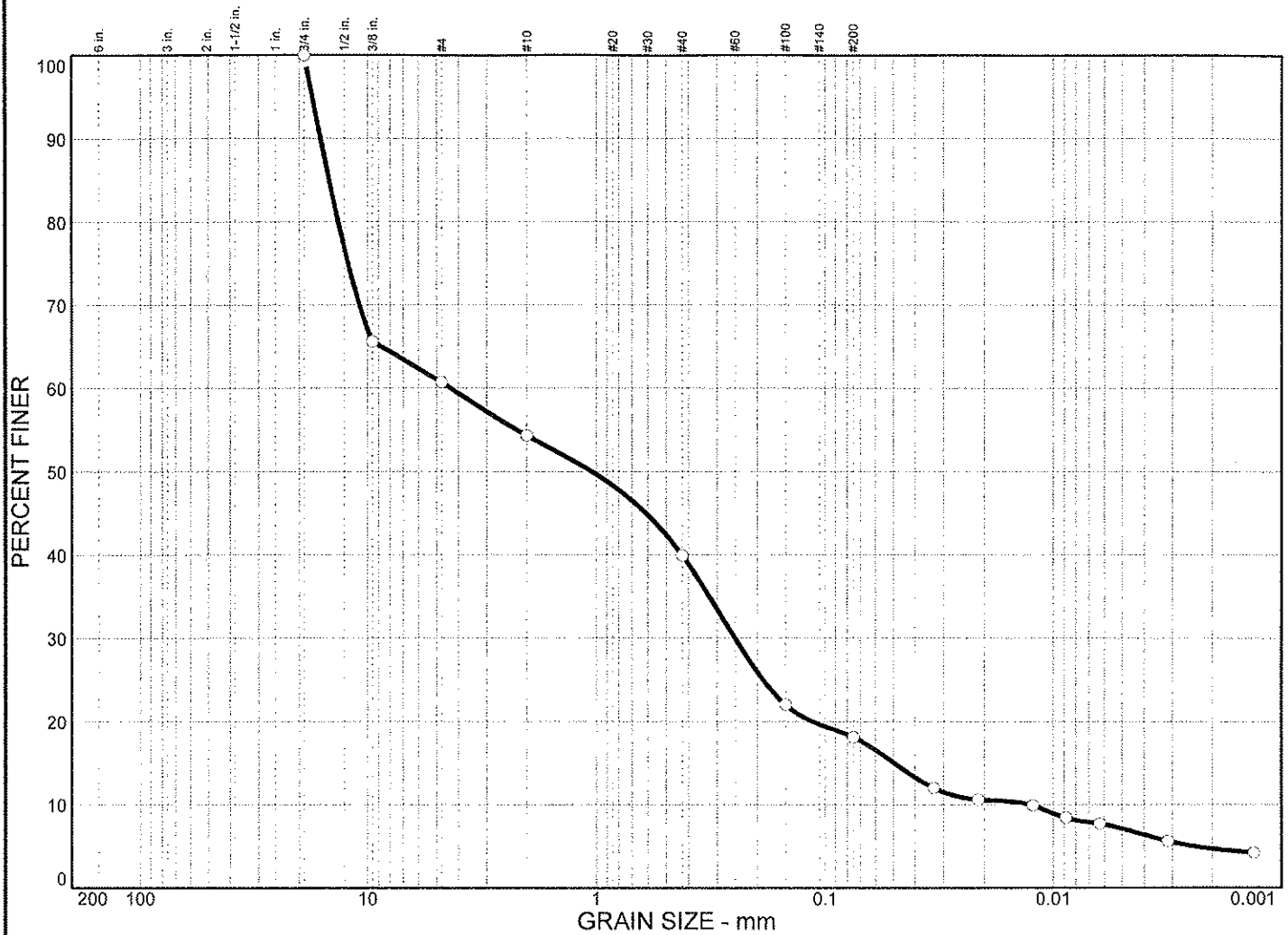
Grain Size (mm)	Percent Finer (%)
4.75	100
2.0	93
0.85	86
0.425	82
0.25	68
0.15	30
0.075	22
0.0475	12
0.025	10
0.015	7
0.0075	6
0.00475	4
0.0025	3

[illegible]

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line ○ Source: SS/T - 3 Sample No.: S-5,S-6,S-7 Elev./Depth: 14.5' - 25.0'	Remarks: ○ Natural Moisture = 11.1%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	39.3	42.6	11.0	7.1

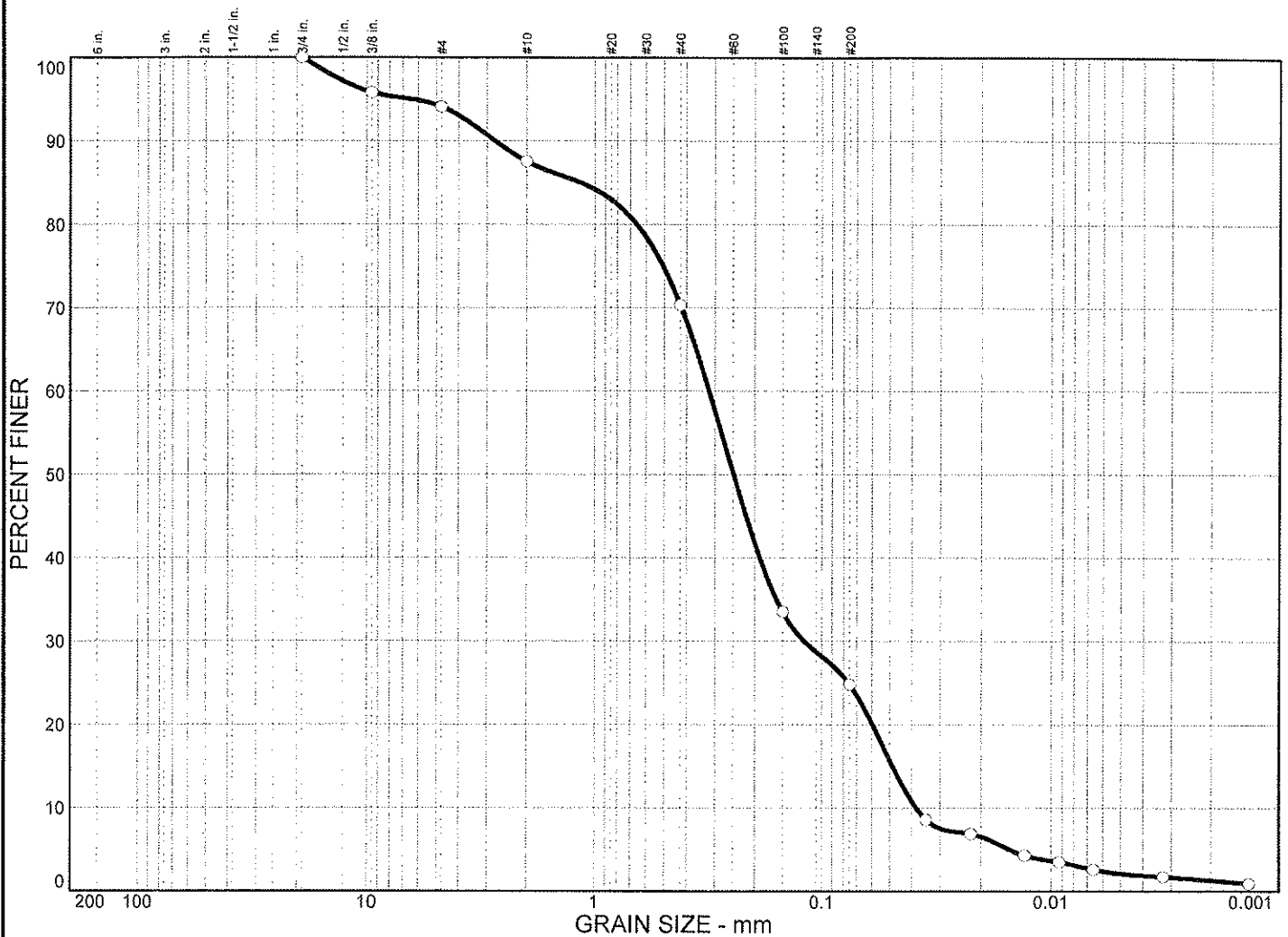
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NP	NP	14.8	4.34	1.05	0.251	0.0495	0.0127	1.14	341.53

MATERIAL DESCRIPTION	USCS	AASHTO
○ Light Brown, F-C SAND and Fine GRAVEL, Little Silt, Trace Clay and Mica.	SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: SS/T - 6 Sample No.: S-3 & S-4 Elev./Depth: 4.0' - 8.0'	Remarks: ○ Natural Moisture = 7.6%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	5.9		69.3			22.7		2.1	
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	NP	NP	1.16	0.319	0.248	0.120	0.0485	0.0382	1.19	8.34
MATERIAL DESCRIPTION								USCS	AASHTO	
○ Grayish Brown, Micaceous, Silty F-C SAND, Trace Fine Gravel.								SM		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: Wayne - 5 Sample No.: S-2 & S-3 Elev./Depth: 3.0' - 7.0'	Remarks: ○ Natural Moisture = 5.1%
Particle Size Distribution Report E2CR, Inc.	

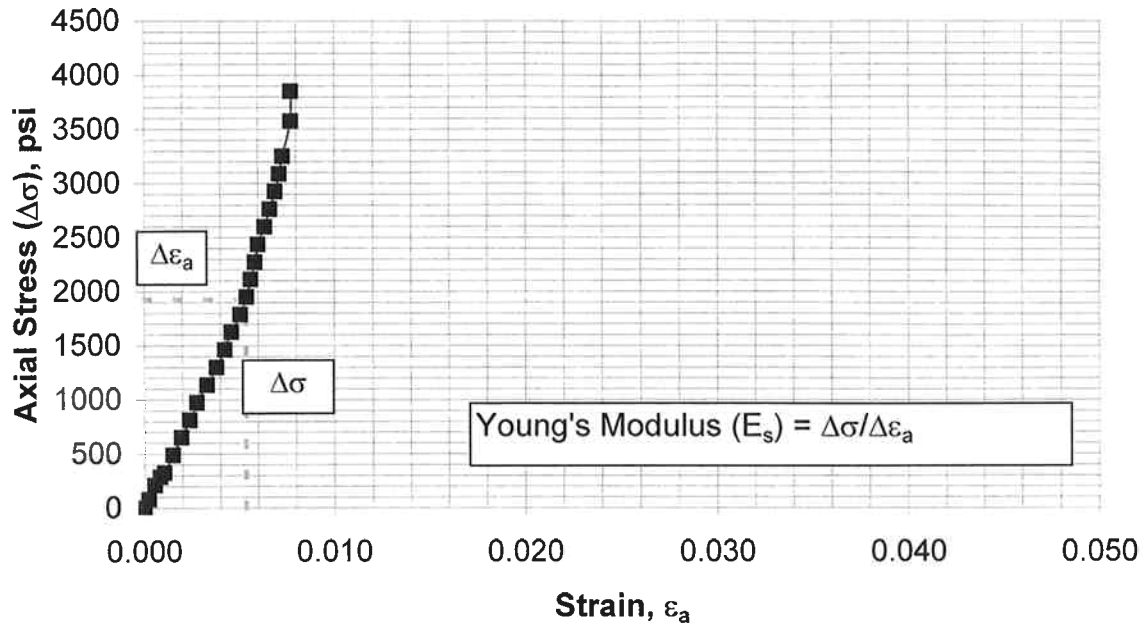
Figure



Appendix O

Silver Spring Rock Laboratory

Test Data



Boring No.	Manchester 1
Run No	RUN-1
Depth	51.5 FEET
Diameter, D	2.0 INCH
Length, L	4.2 INCH
L/D Ratio	2.1
Temperature During Testing	68 °F
Axial Stress at Failure	3850 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.60E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

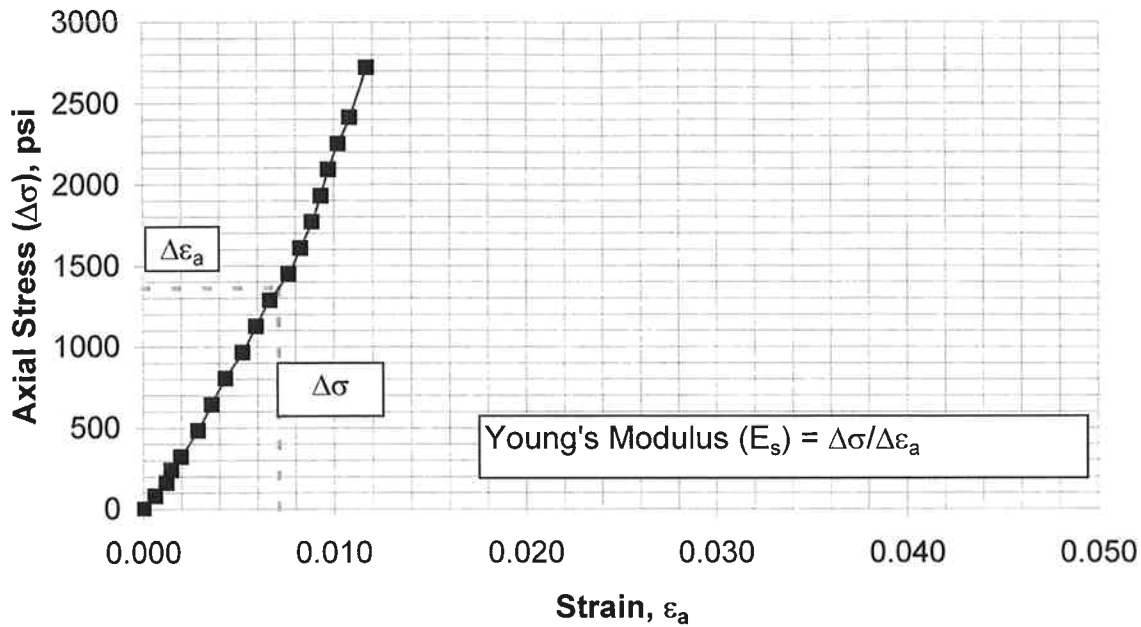
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 1
Run No	RUN-3
Depth	61 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	2720 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.91E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

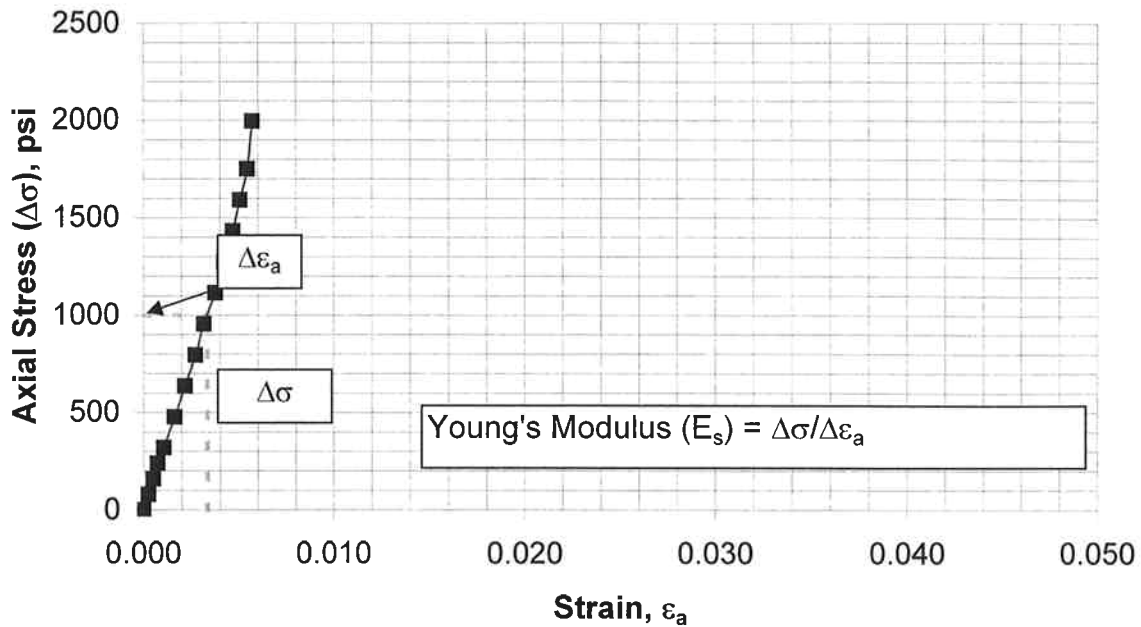
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 1
Run No	RUN-7
Depth	75.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	2000 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.01E+05	PSI
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Description:

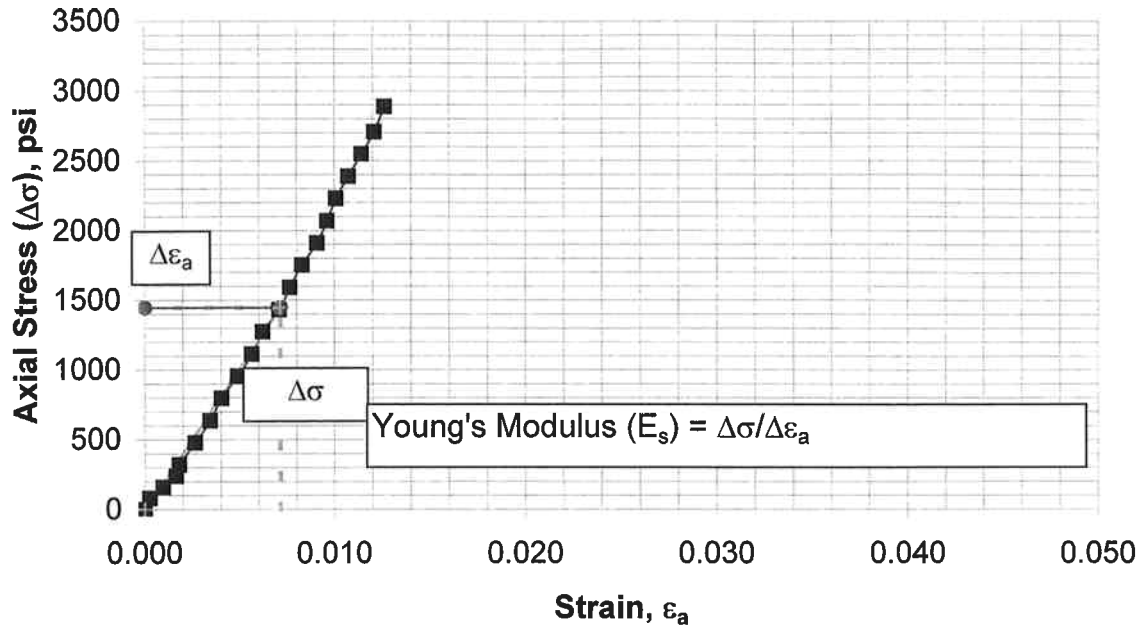
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	<u>Manchester 2</u>	
Run No	<u>RUN-1</u>	
Depth	<u>26</u>	FEET
Diameter, D	<u>2.0</u>	INCH
Length, L	<u>4.1</u>	INCH
L/D Ratio	<u>2.0</u>	
Temperature During Testing	<u>68</u>	°F
Axial Stress at Failure	<u>2890</u>	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.03E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

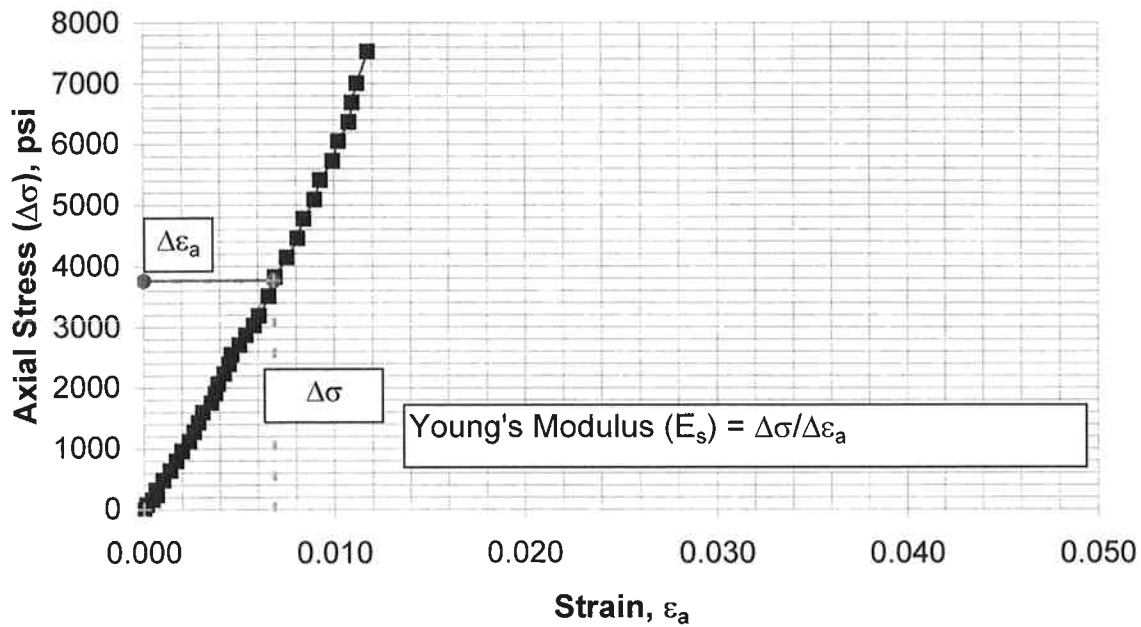
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 2
Run No	RUN-4
Depth	42 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	7520 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	5.50E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

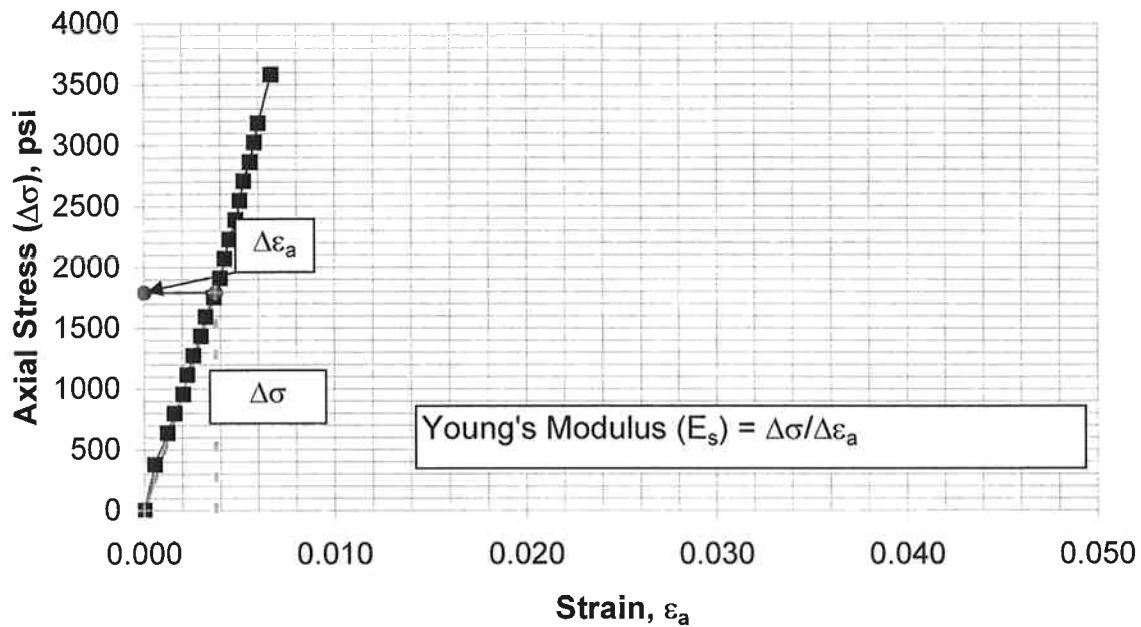
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 2
Run No	RUN-6
Depth	51 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3580 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.77E+05	PSI
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Description:

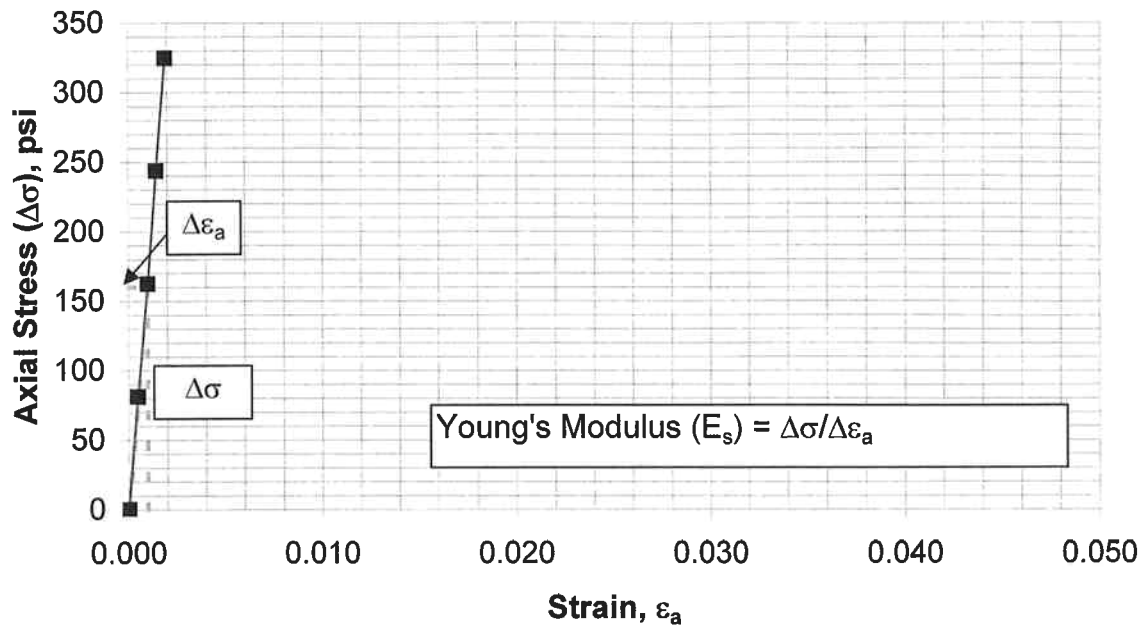
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 2
Run No	RUN-7
Depth	55 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	320 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.67E+05	PSI
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Description:

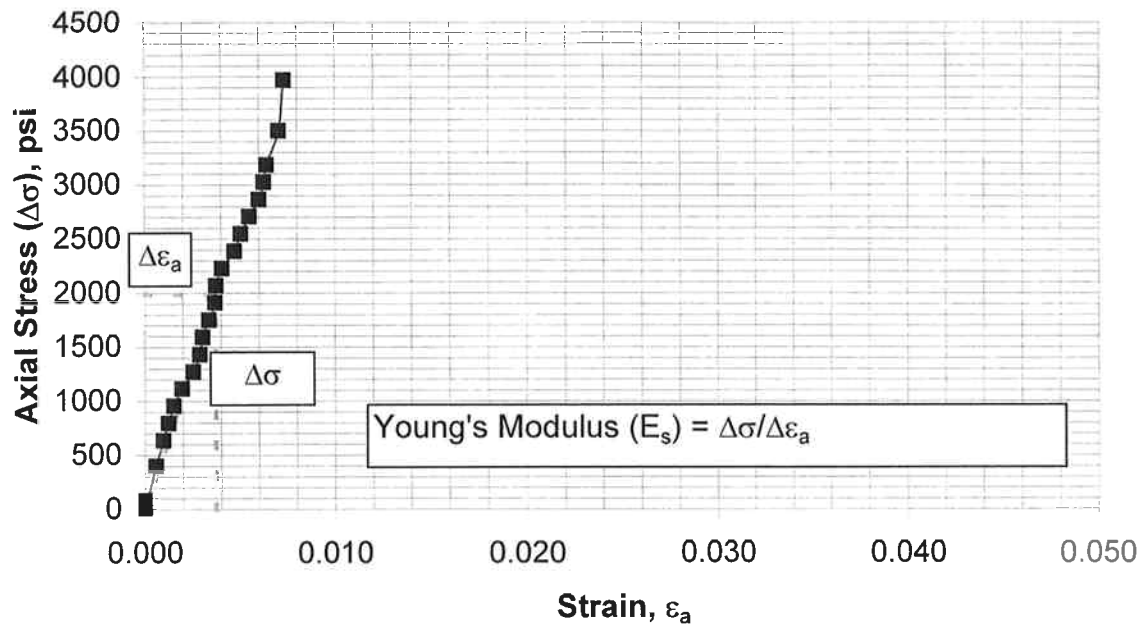
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 2	
Run No	RUN-10	
Depth	70	FEET
Diameter, D	2.0	INCH
Length, L	4.1	INCH
L/D Ratio	2.0	
Temperature During Testing	68	°F
Axial Stress at Failure	3970	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	5.34E+05	PSI
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Description:

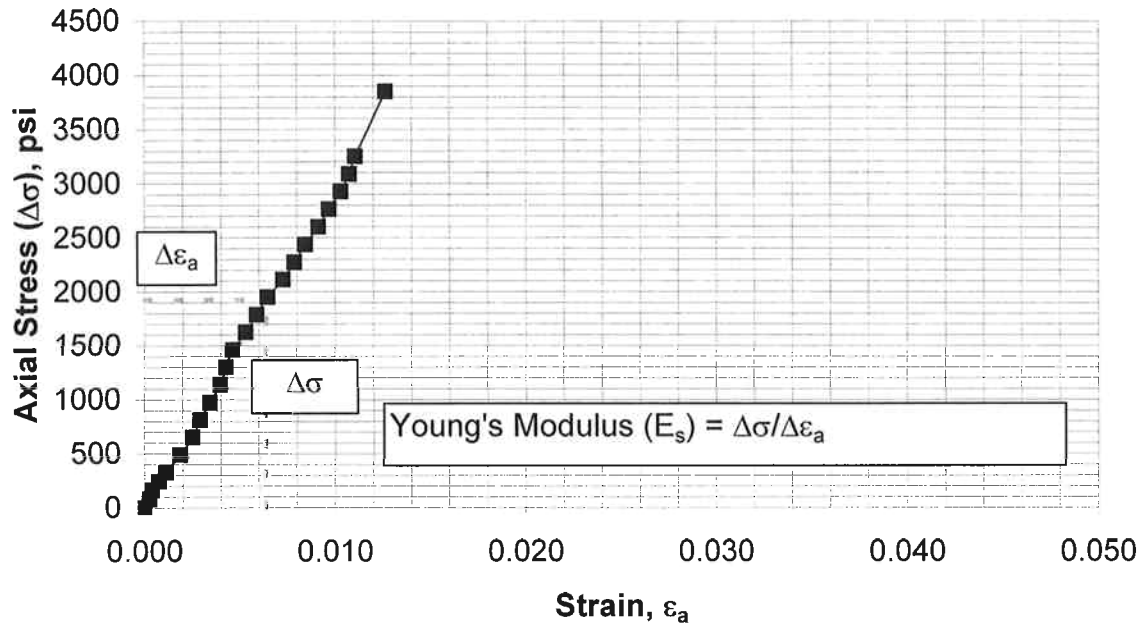
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 3
Run No	RUN-3
Depth	45.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3850 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.02E+05	PSI
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Description:

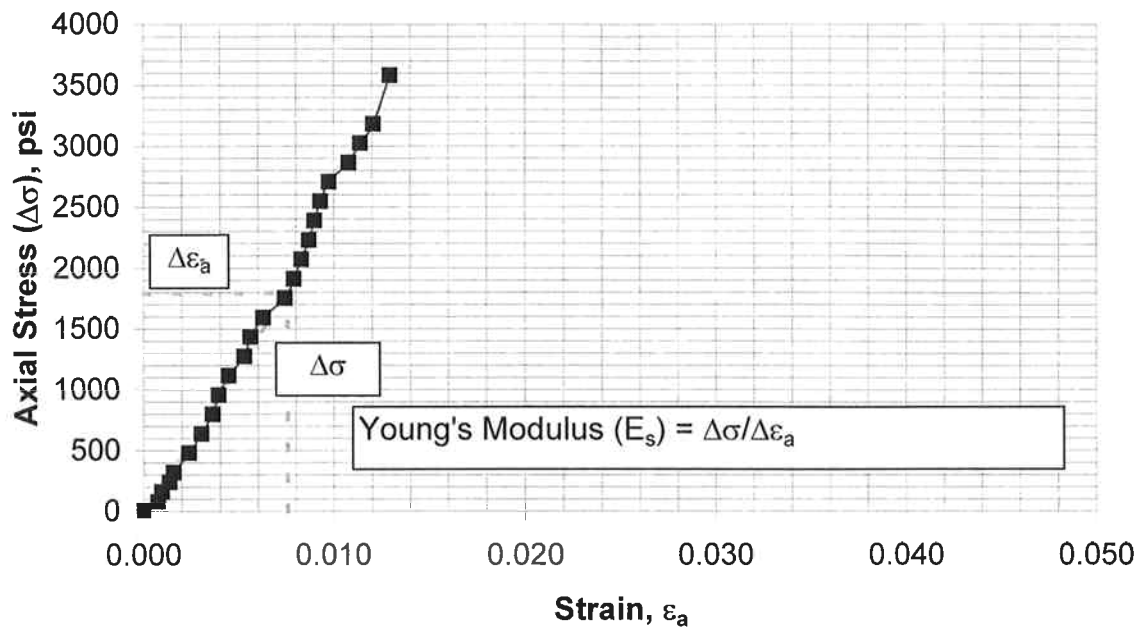
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 3
Run No	RUN-5
Depth	58.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3580 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.38E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

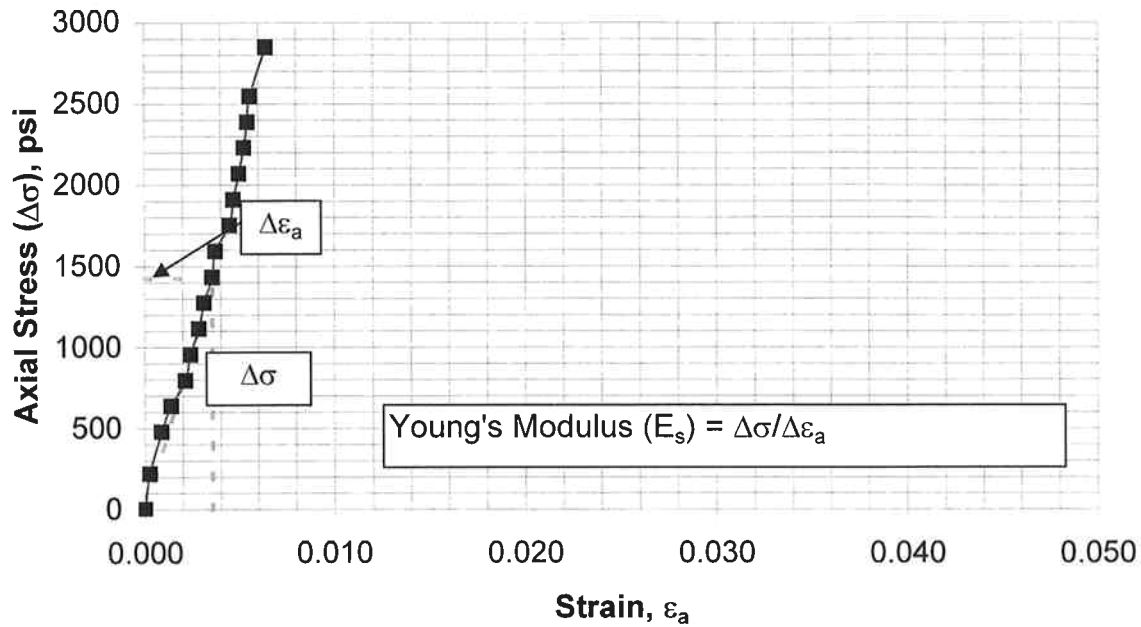
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 3
Run No	RUN-7
Depth	69 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	2850 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.04E+05	PSI
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Description:

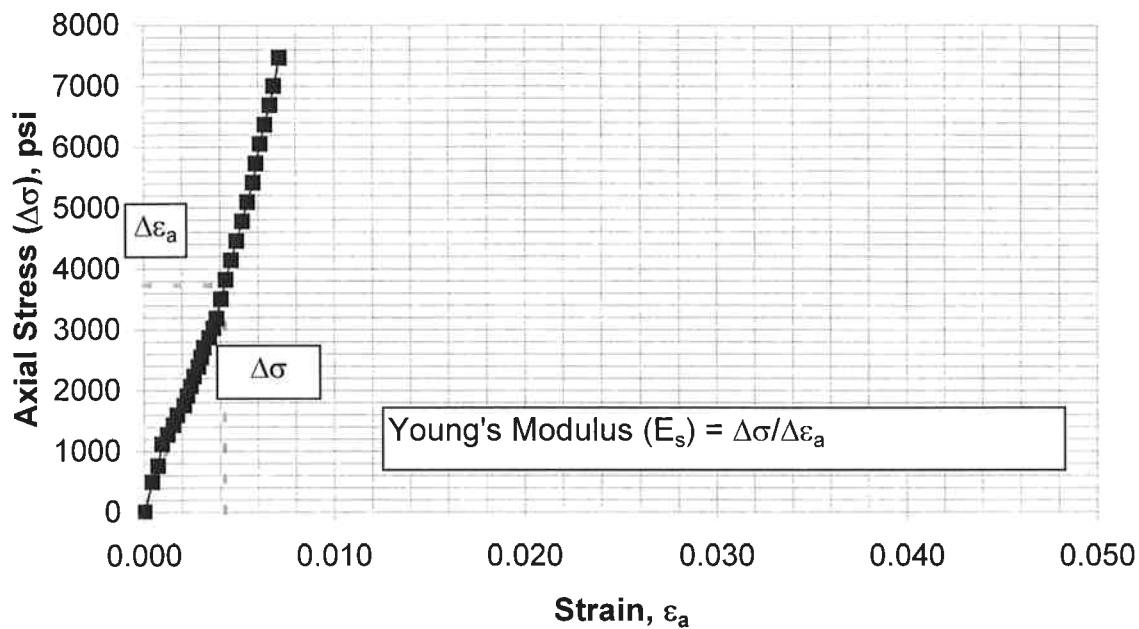
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 3
Run No	RUN-10
Depth	82.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	7460 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	8.81E+05	PSI
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Description:

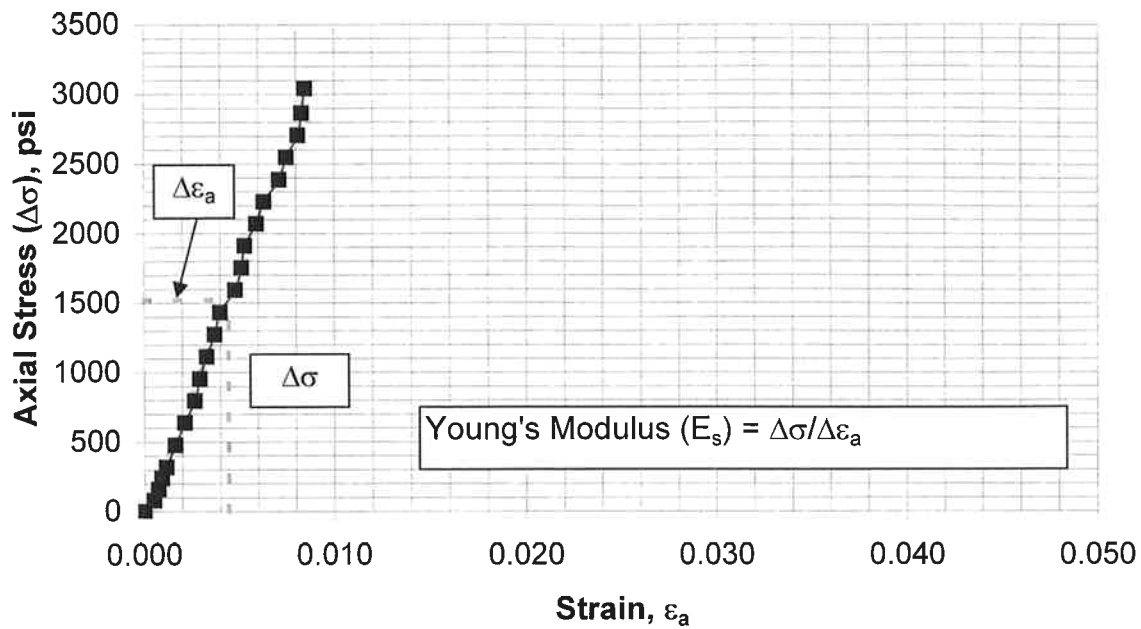
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE



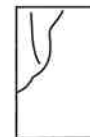


Boring No.	Manchester 3
Run No	RUN-12
Depth	93 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3040 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.43E+05	PSI
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Description:

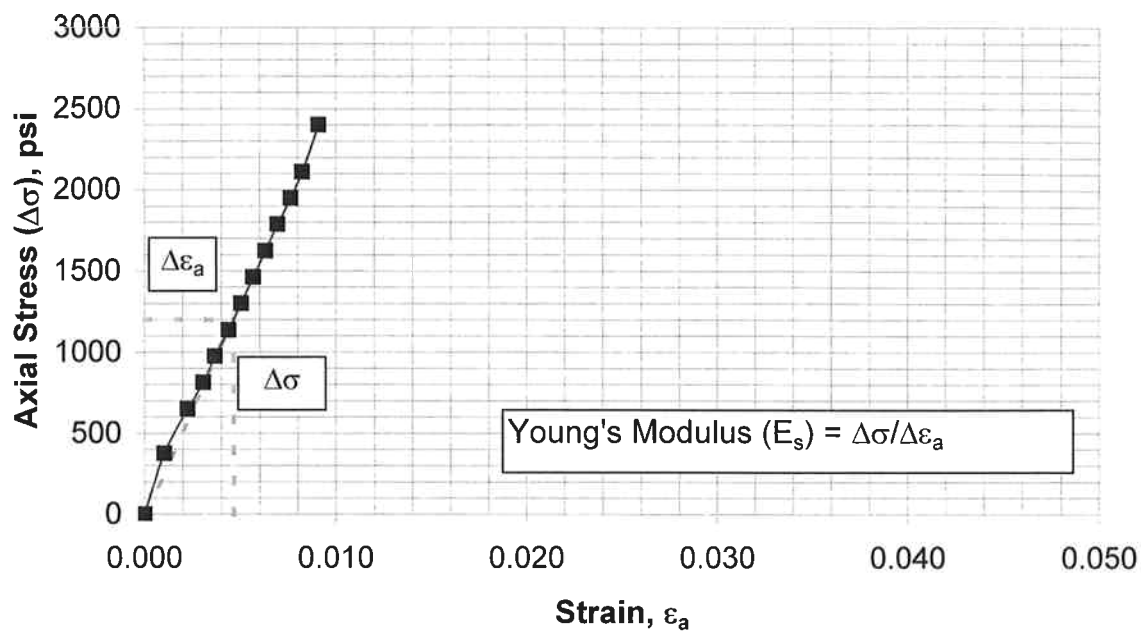
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 4
Run No	RUN-1
Depth	38.5 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	2400 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.58E+05	PSI
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Description:

Sketch at Failure:

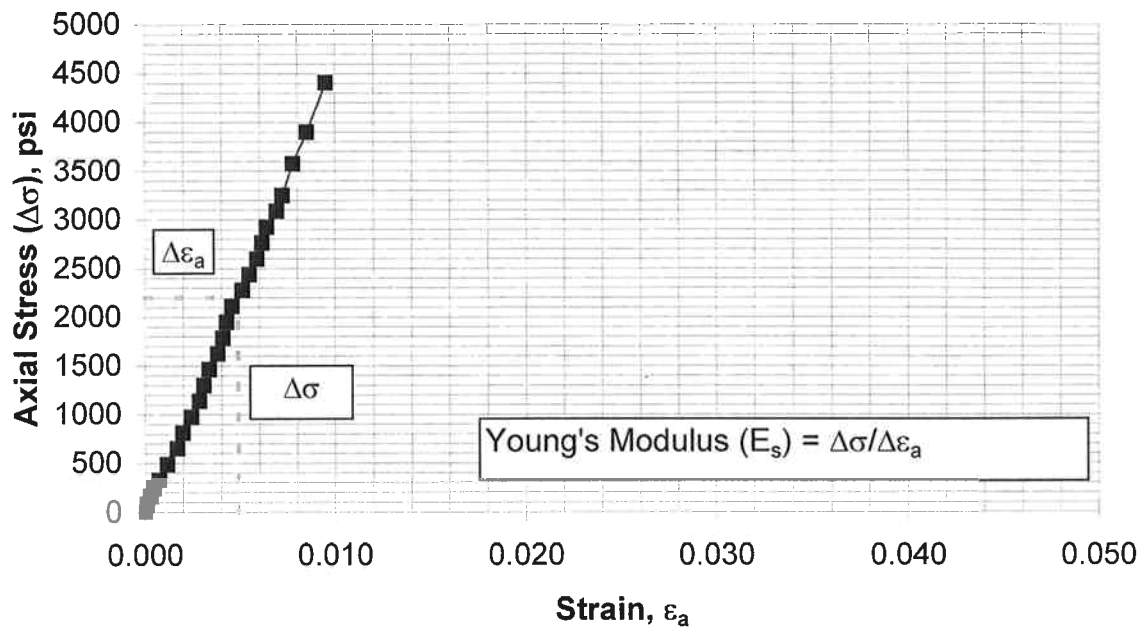


Project Name: Purple Line, Silver Spring, MD
Project No.: 07503-04

Date: 6/2/07
Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 4	
Run No	RUN-3	
Depth	48	FEET
Diameter, D	2.0	INCH
Length, L	3.9	INCH
L/D Ratio	2.0	
Temperature During Testing	68	°F
Axial Stress at Failure	4400	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.53E+05	PSI
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Description:

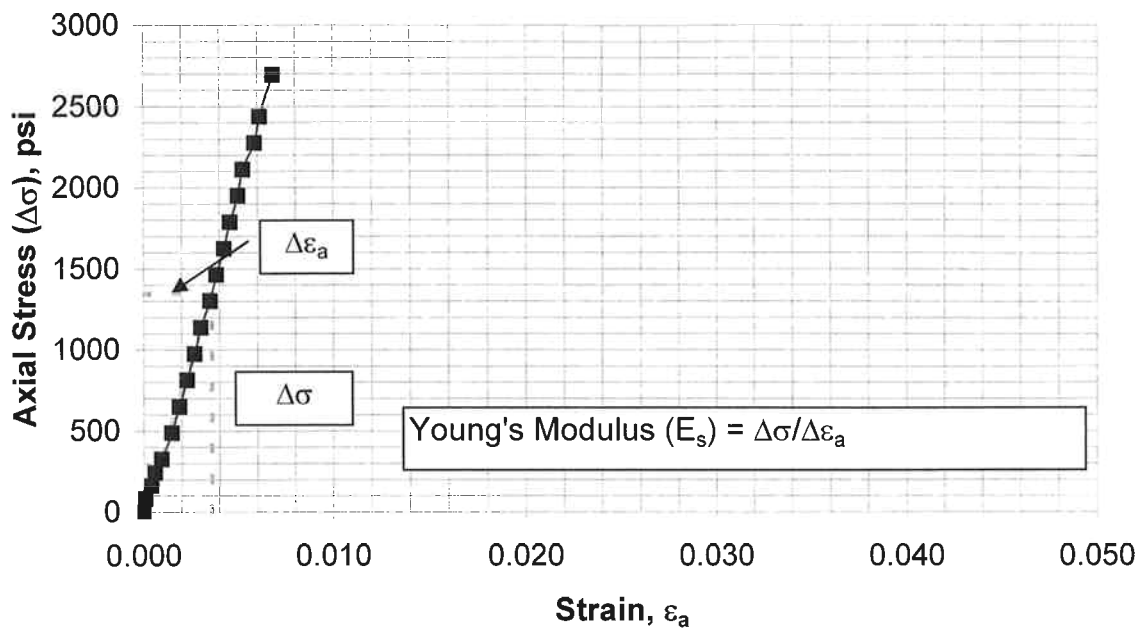
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 4
Run No	RUN-7
Depth	66 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	2690 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.74E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

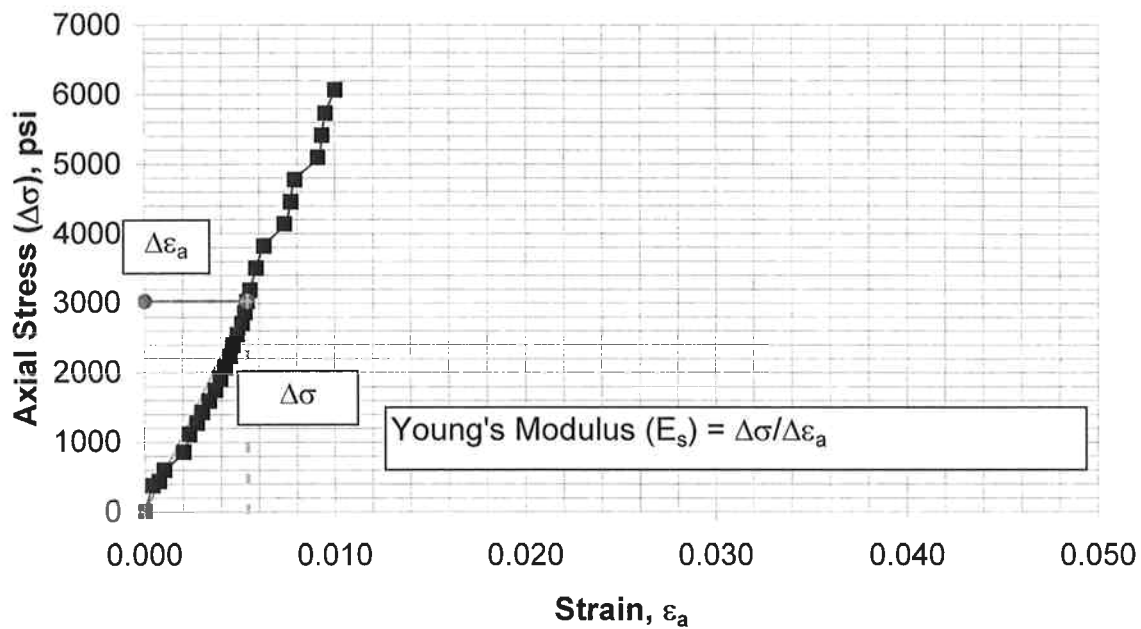
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 4
Run No	RUN-8
Depth	70 FEET
Diameter, D	2.0 INCH
Length, L	4.1 INCH
L/D Ratio	2.1
Temperature During Testing	68 °F
Axial Stress at Failure	6060 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	5.62E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

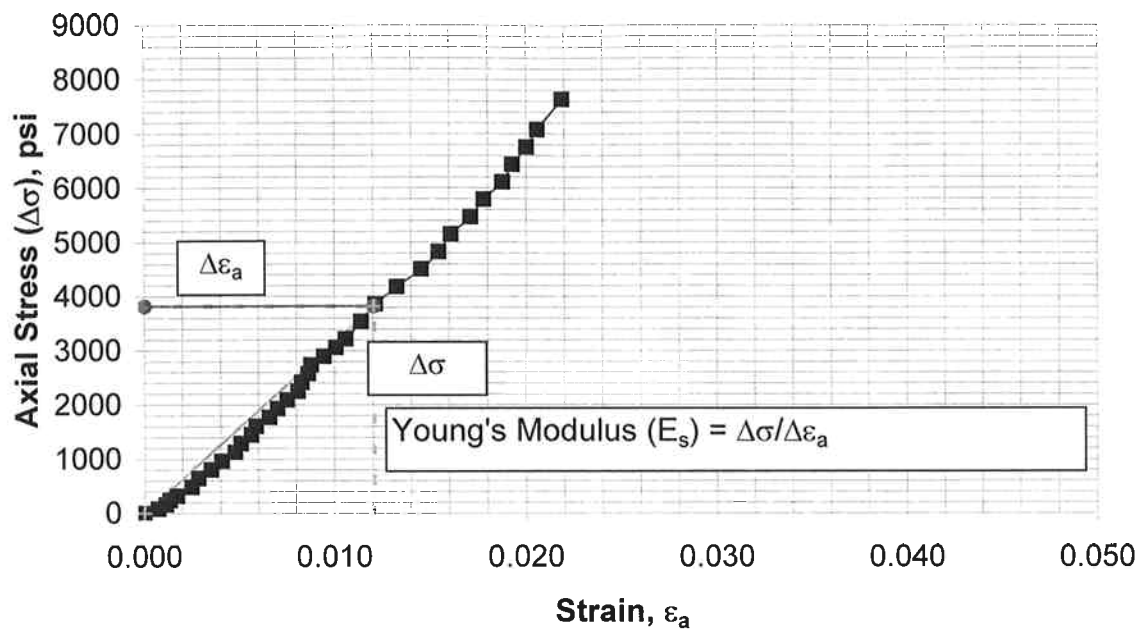
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Manchester 4
Run No	RUN-9
Depth	76.5 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	7640 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.17E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

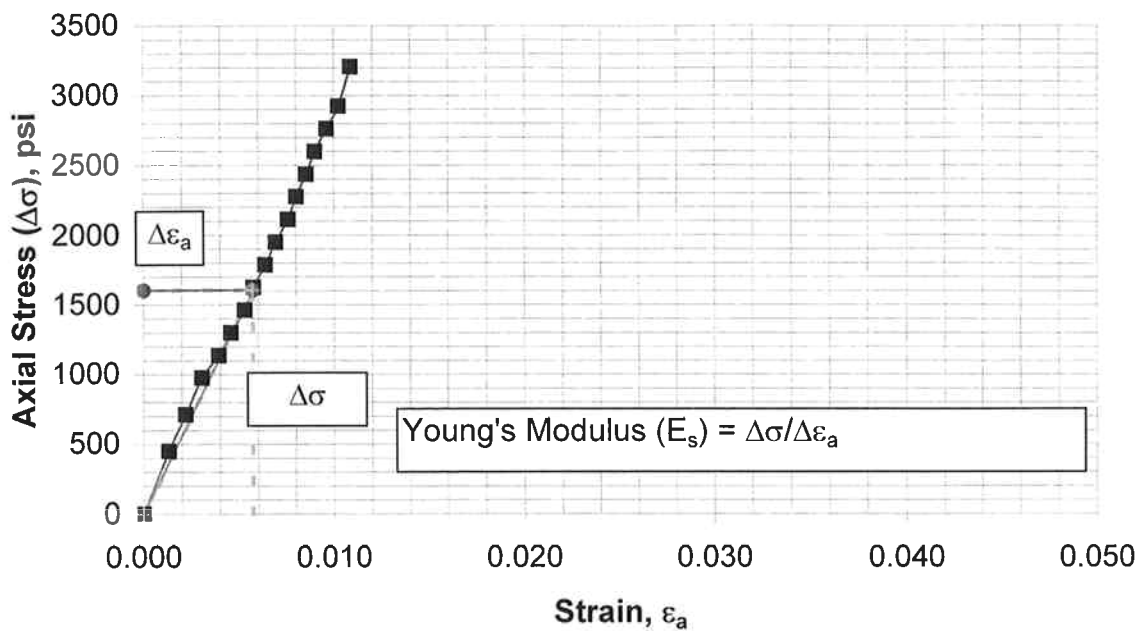
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 1
Run No	RUN-1
Depth	47 FEET
Diameter, D	2.0 INCH
Length, L	3.8 INCH
L/D Ratio	1.9
Temperature During Testing	68 °F
Axial Stress at Failure	3210 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.82E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

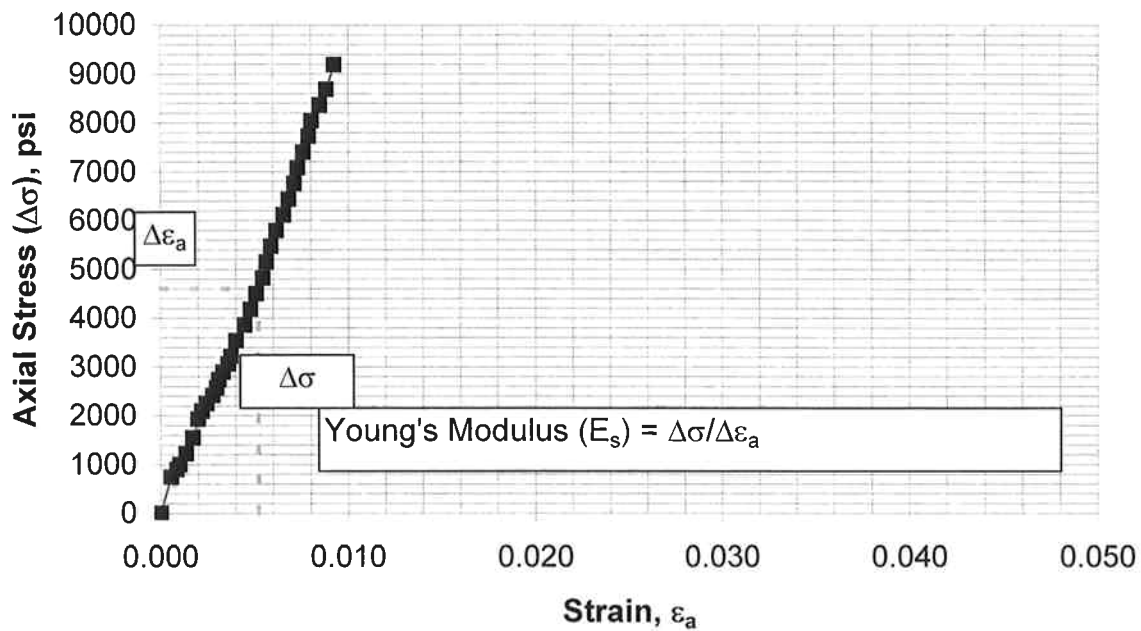
Date: 5/16/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 1
Run No	RUN-4
Depth	64 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	9190 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	8.84E+05	PSI
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Description:

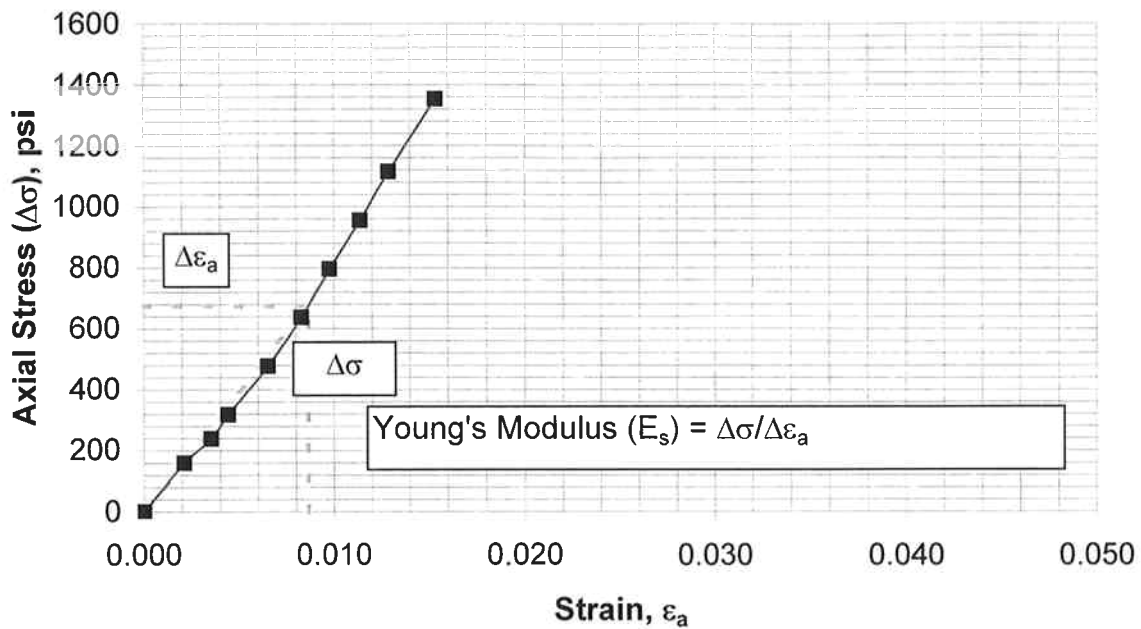
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	5/16/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 2
Run No	RUN-4
Depth	62.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	1350 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	7.83E+04	PSI
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Description:

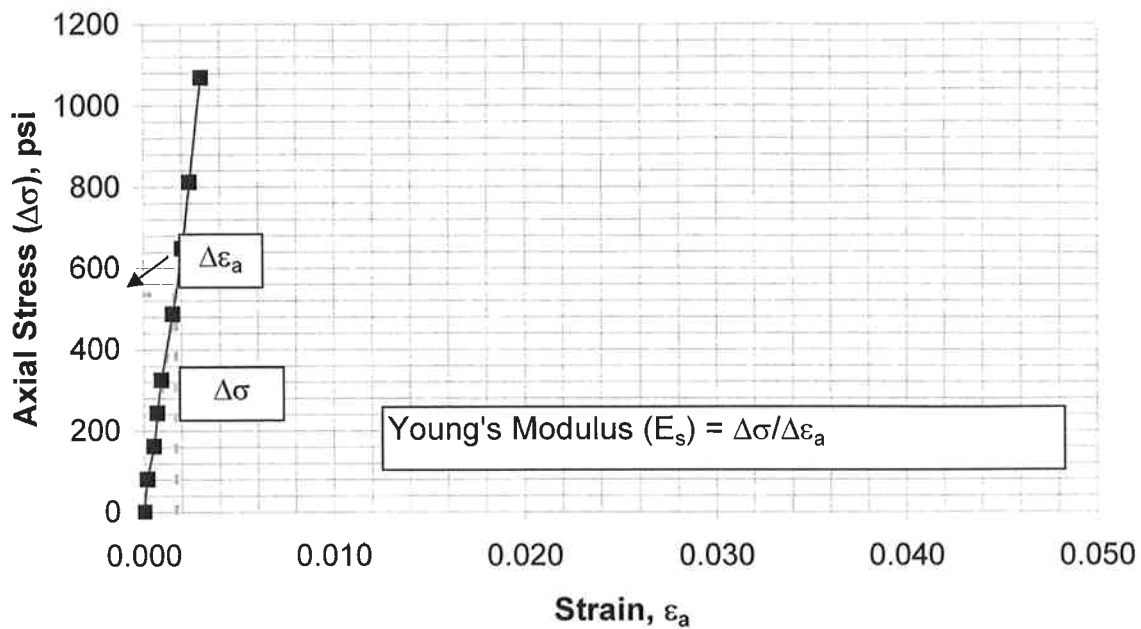
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 2
Run No	RUN-6
Depth	74 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	1070 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.18E+05	PSI
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Description:

Sketch at Failure:

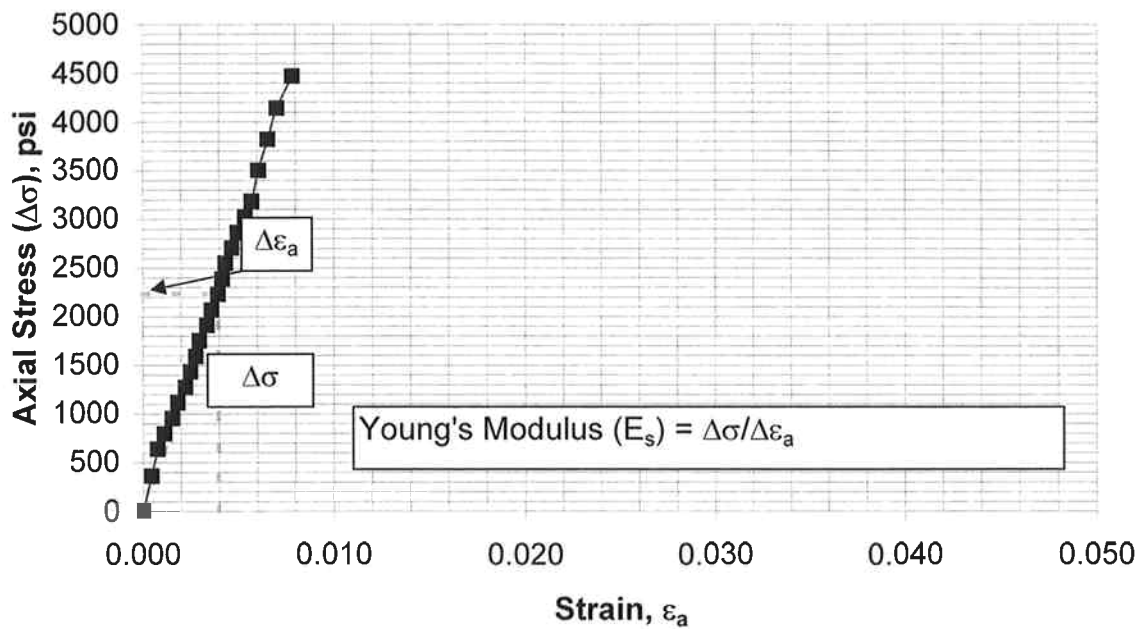


Project Name: Purple Line, Silver Spring, MD
Project No.: 07503-04

Date: 6/2/07
Figure:

UNIAXIAL COMPRESSION OF ROCK CORE



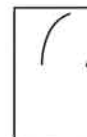


Boring No.	Plymouth 2
Run No	RUN-9
Depth	85 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	4470 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	5.64E+05	PSI
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Description:

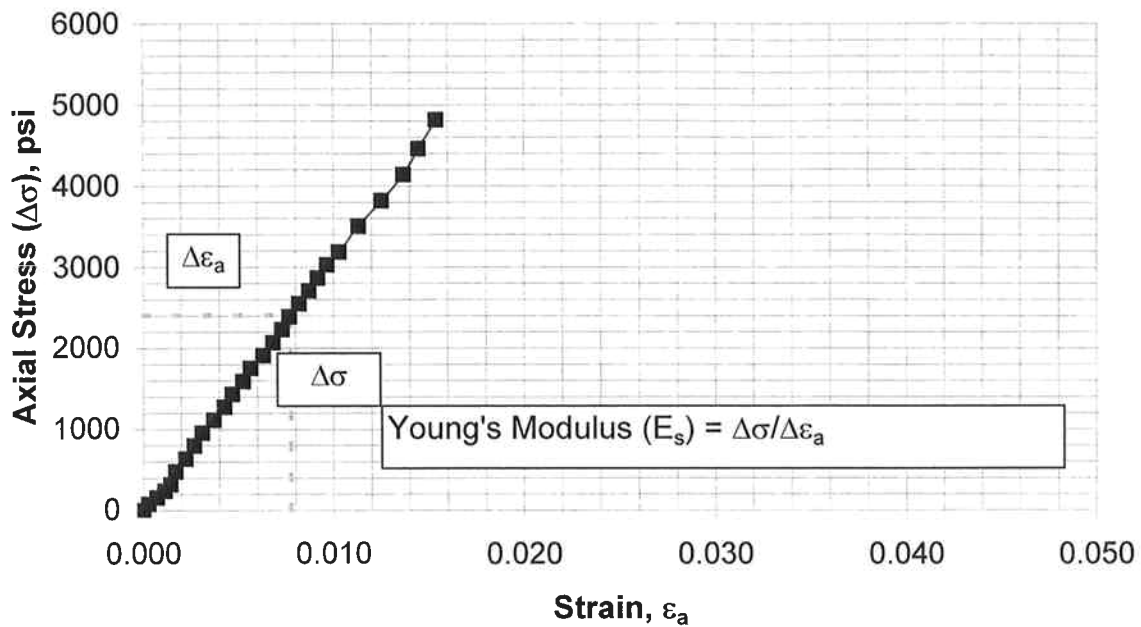
Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD Date: 6/2/07
Project No.: 07503-04 Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 3
Run No	RUN-1
Depth	42 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	4810 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.11E+05	PSI
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Description:

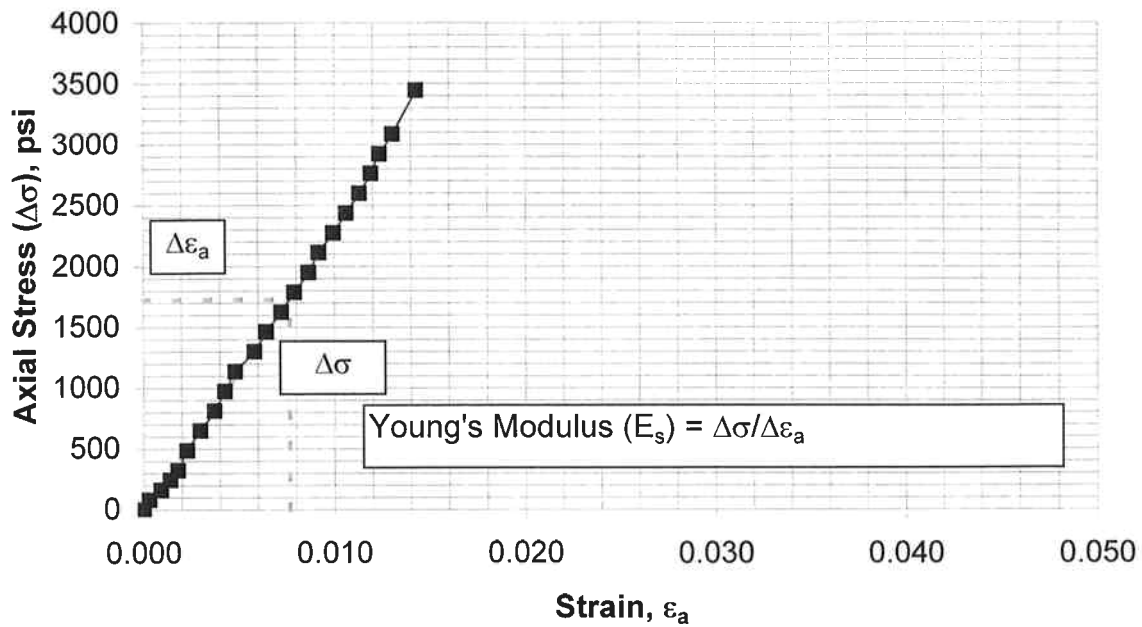
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 3
Run No	RUN-3
Depth	50 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3450 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.26E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

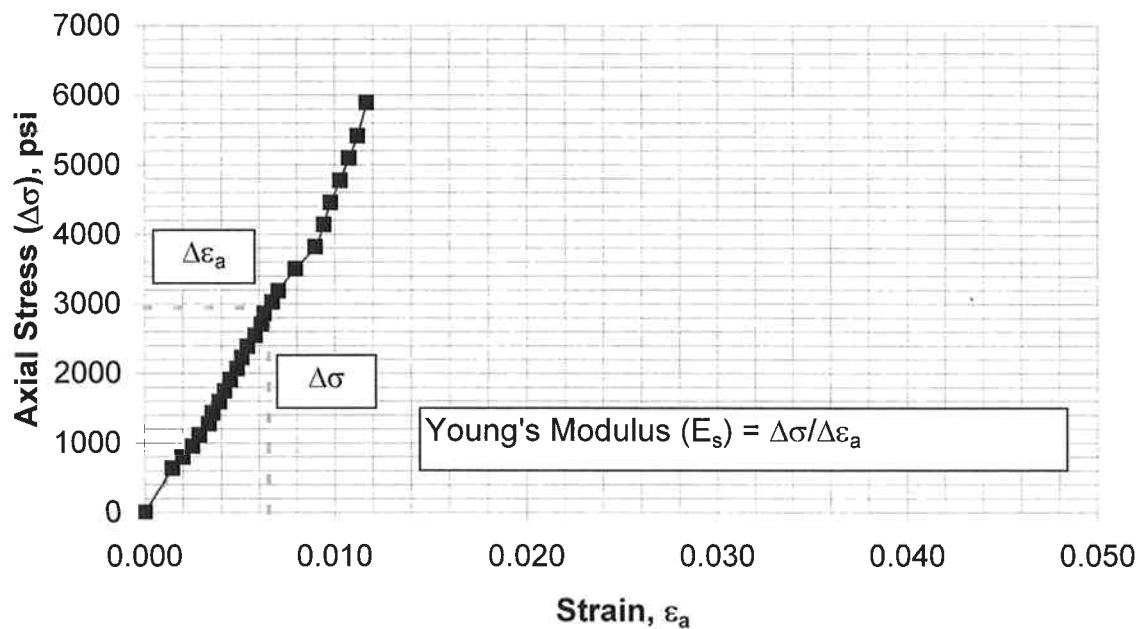
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Plymouth 3
Run No	RUN-5
Depth	64 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	5890 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.54E+05	PSI
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Description:

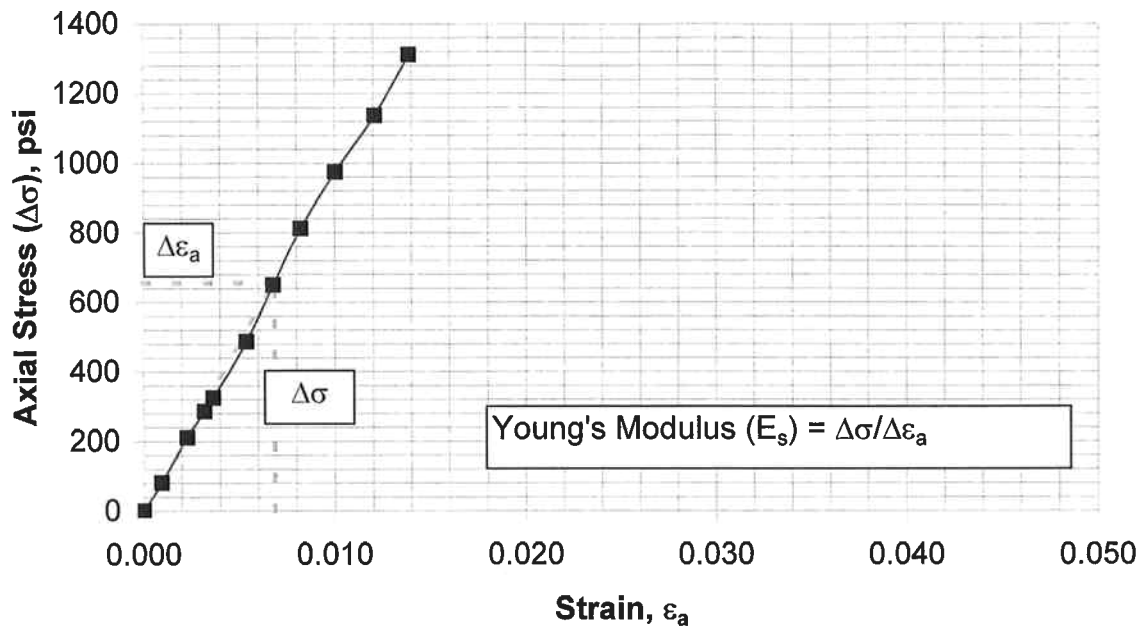
Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD Date: 6/2/07
Project No.: 07503-04 Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T1
Run No	RUN-1
Depth	46.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	1310 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	9.57E+04	PSI
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Description:

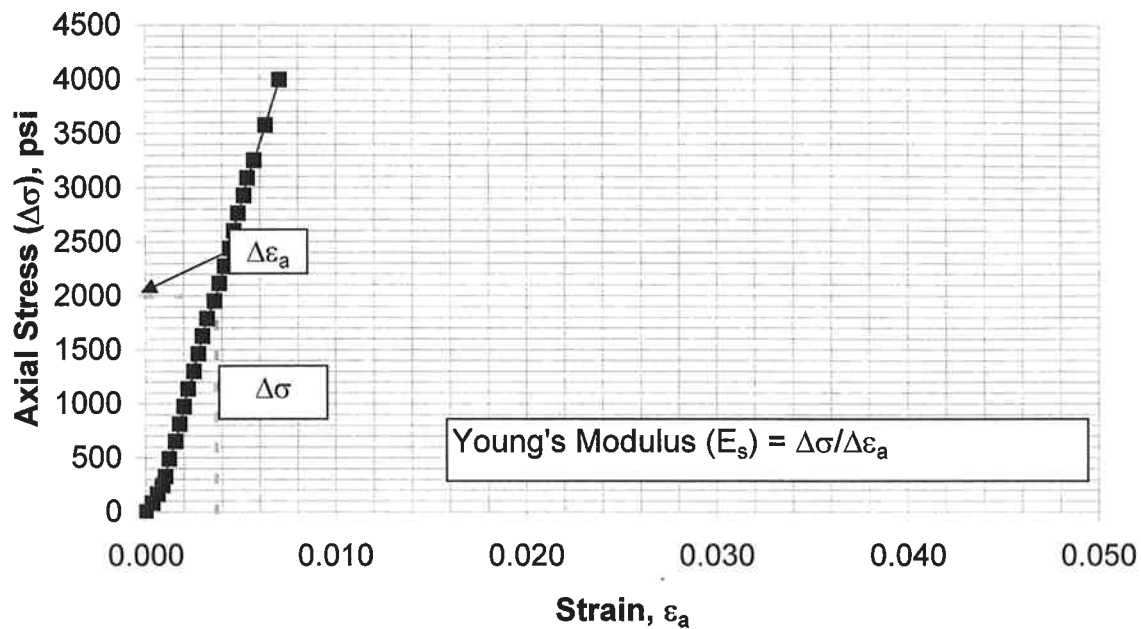
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T1
Run No	RUN-4
Depth	60 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3990 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	5.40E+05	PSI
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. Description:

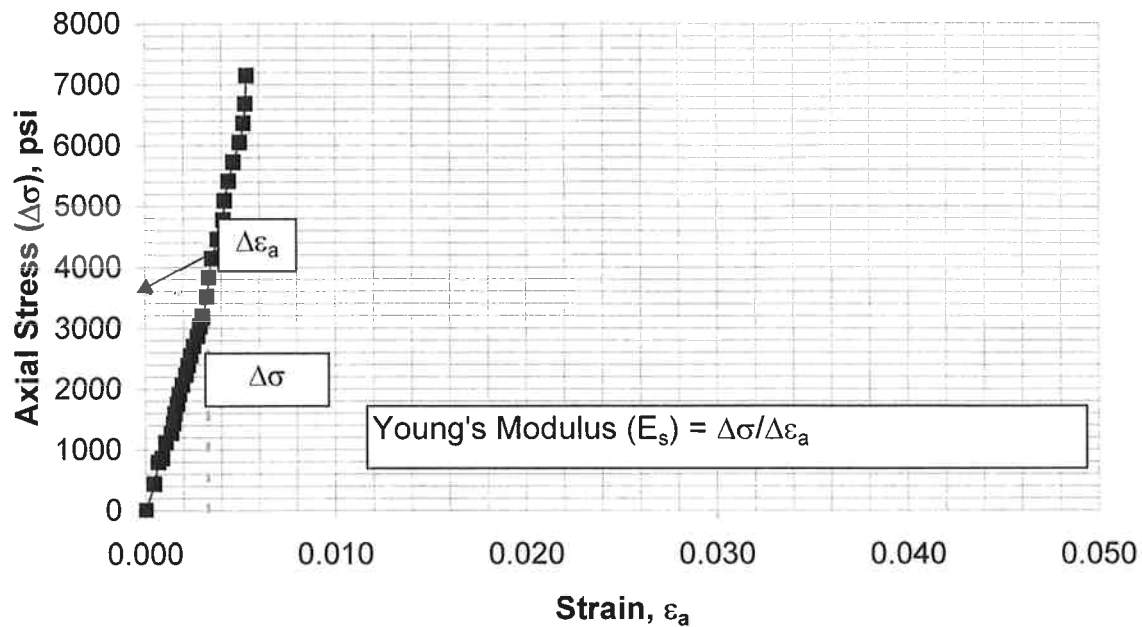
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T1
Run No	RUN-5
Depth	68 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	7150 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.09E+06	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

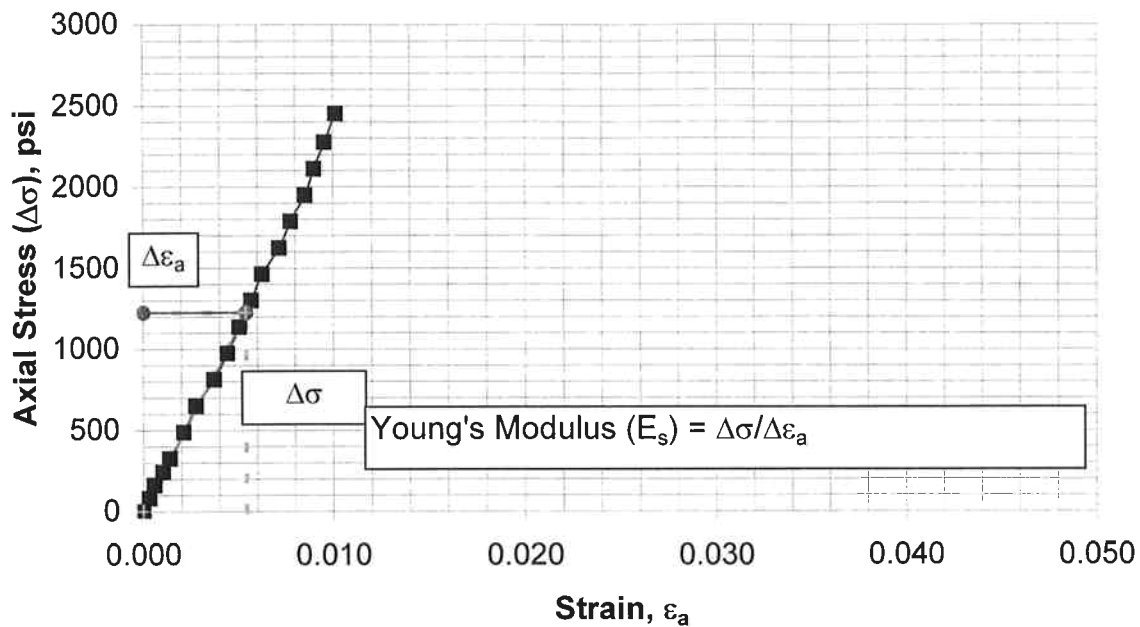
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T2
Run No	RUN-2
Depth	34.8 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	2450 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.27E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

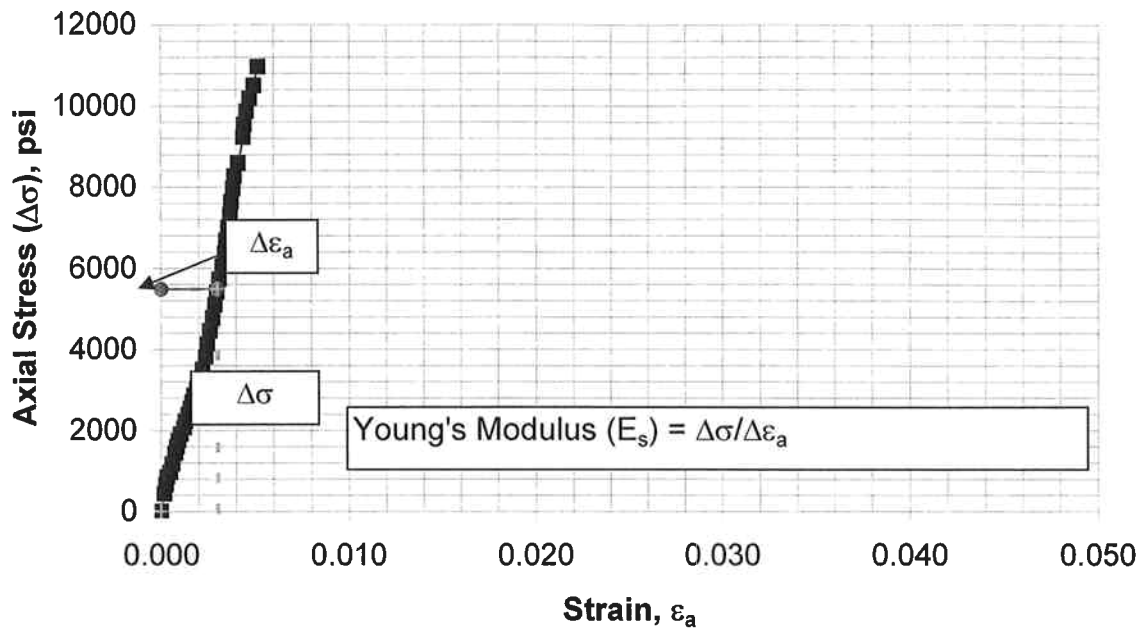
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T2
Run No	RUN-7
Depth	58.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	10970 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.83E+06	PSI
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Description:

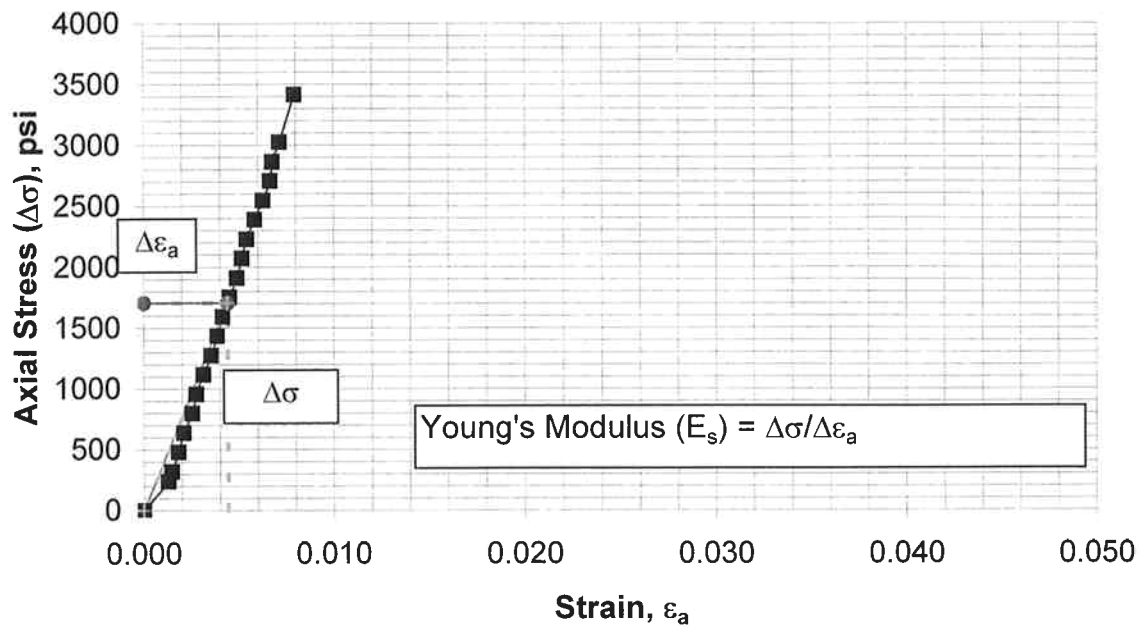
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T2
Run No	RUN-10
Depth	75 FEET
Diameter, D	2.0 INCH
Length, L	4.1 INCH
L/D Ratio	2.1
Temperature During Testing	68 °F
Axial Stress at Failure	3410 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.87E+05	PSI
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Description:

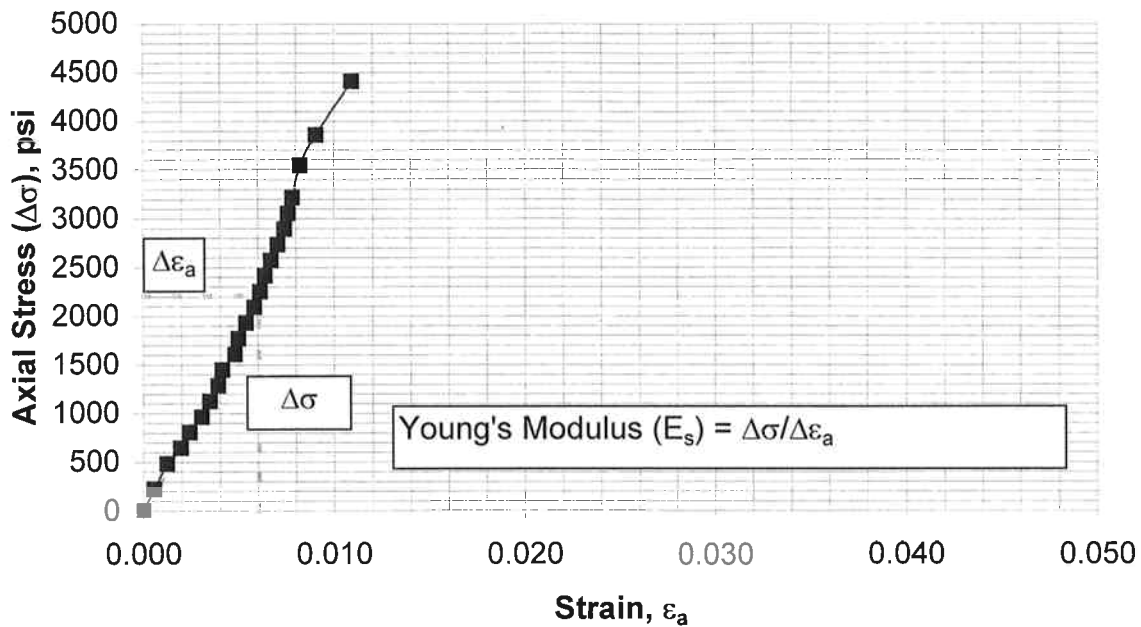
Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD Date: 5/16/07
 Project No.: 07503-04 Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T3
Run No	RUN-2
Depth	39 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	4410 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.65E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

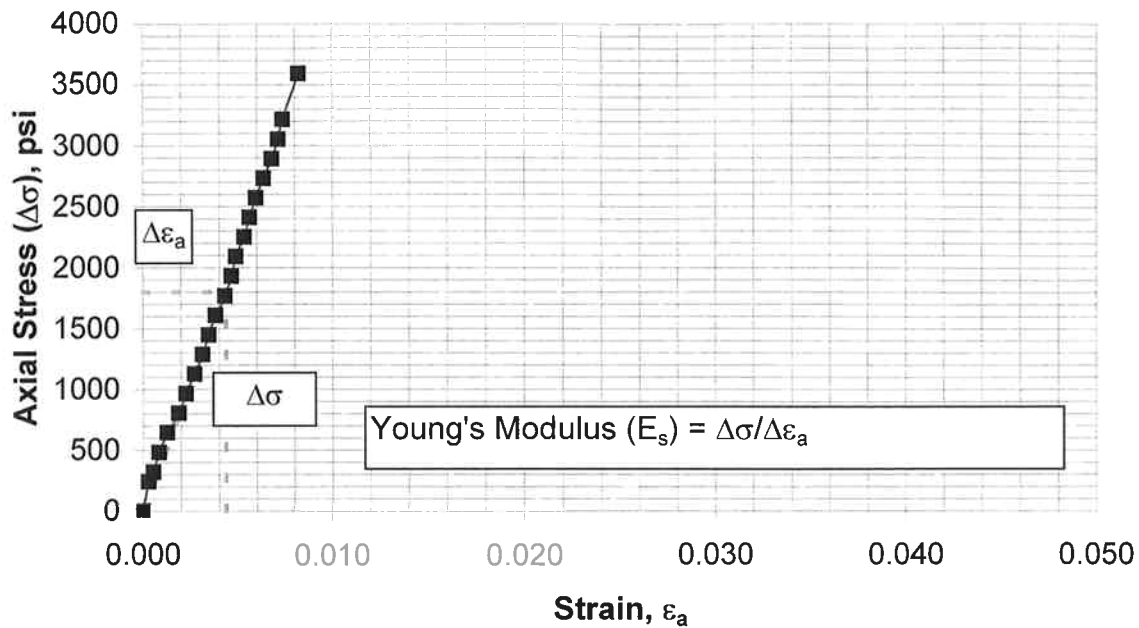
Date: 5/16/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T3
Run No	RUN-3
Depth	40 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3590 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.11E+05	PSI
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Description:

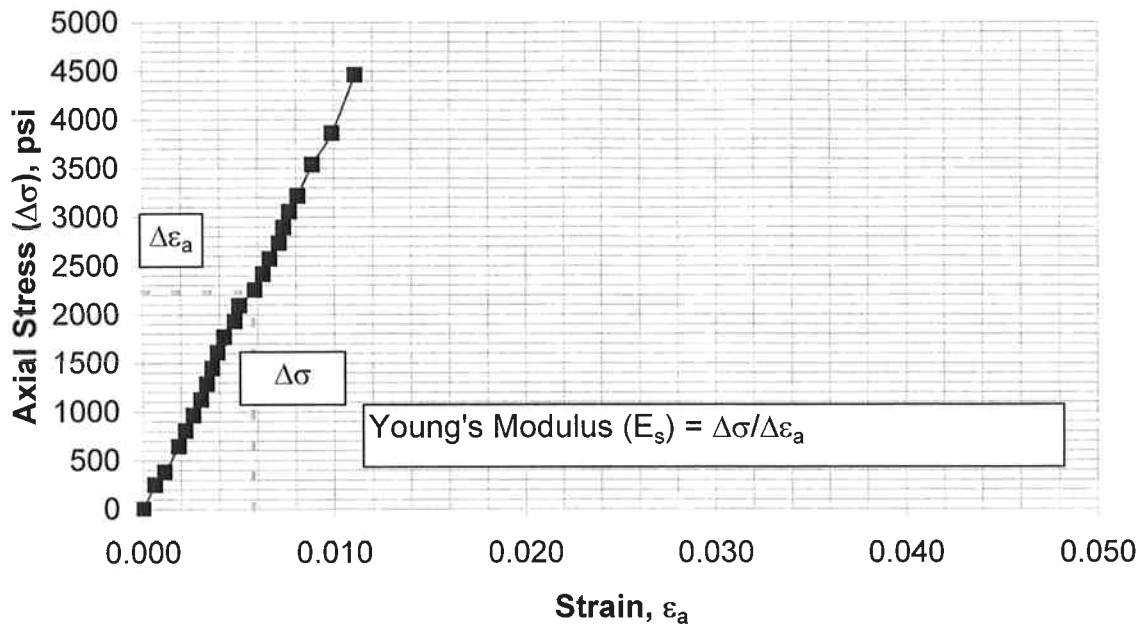
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T3	
Run No	RUN-6	
Depth	57.5	FEET
Diameter, D	2.0	INCH
Length, L	3.9	INCH
L/D Ratio	2.0	
Temperature During Testing	68	°F
Axial Stress at Failure	4460	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.88E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

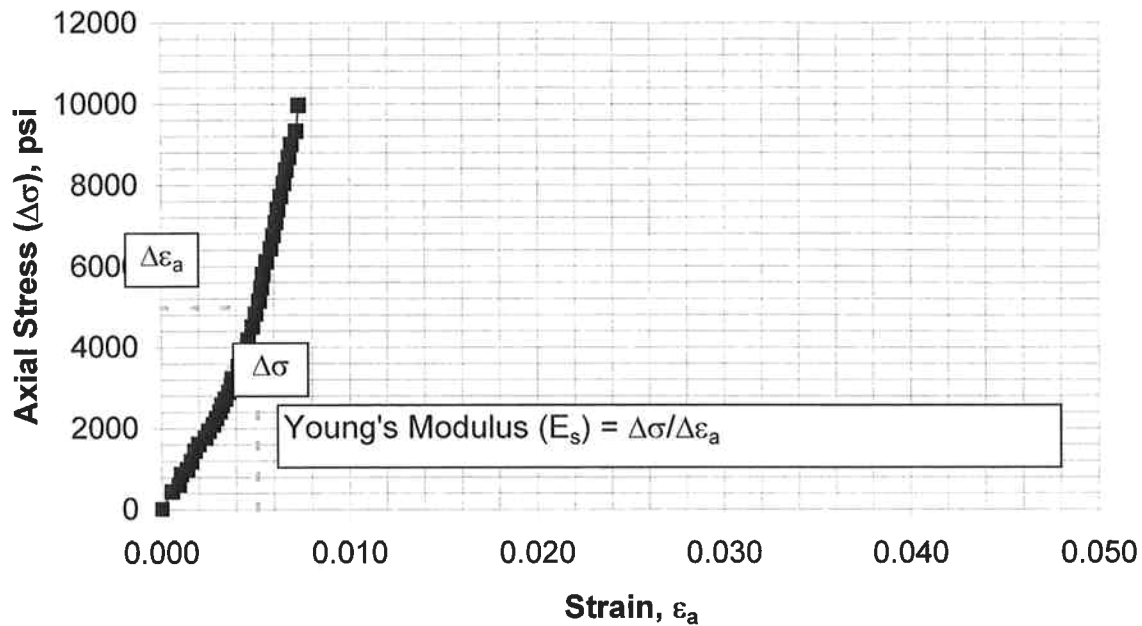
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T3
Run No	RUN-11
Depth	83.5 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	1.9
Temperature During Testing	68 °F
Axial Stress at Failure	9960 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	9.71E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

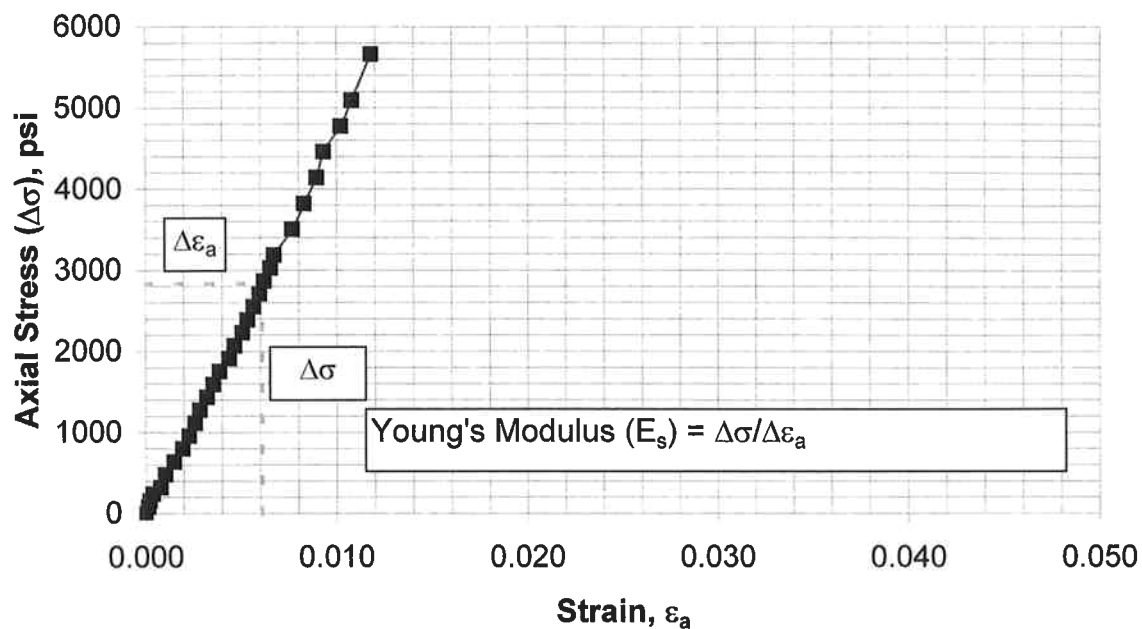
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T4	
Run No	RUN-4	
Depth	30	FEET
Diameter, D	2.0	INCH
Length, L	4.2	INCH
L/D Ratio	2.1	
Temperature During Testing	68	°F
Axial Stress at Failure	5660	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.67E+05	PSI
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.Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

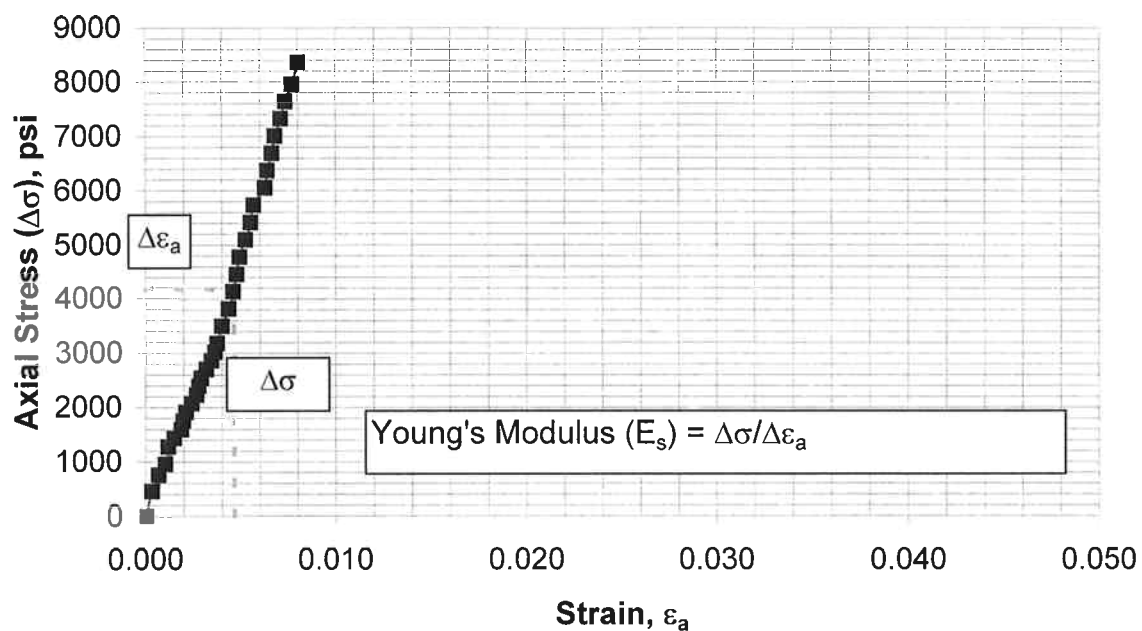
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T4	
Run No	RUN-6	
Depth	44	FEET
Diameter, D	2.0	INCH
Length, L	4.0	INCH
L/D Ratio	2.0	
Temperature During Testing	68	°F
Axial Stress at Failure	8360	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	9.04E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

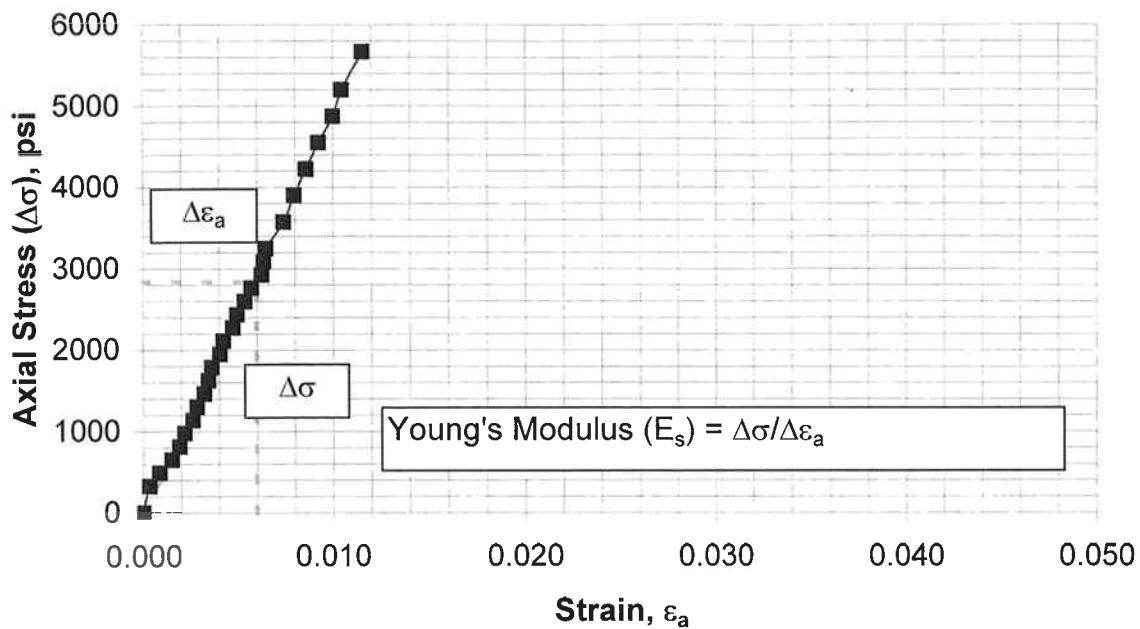
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T4	
Run No	RUN-12	
Depth	73.5	FEET
Diameter, D	2.0	INCH
Length, L	4.0	INCH
L/D Ratio	2.0	
Temperature During Testing	68	°F
Axial Stress at Failure	5670	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.77E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

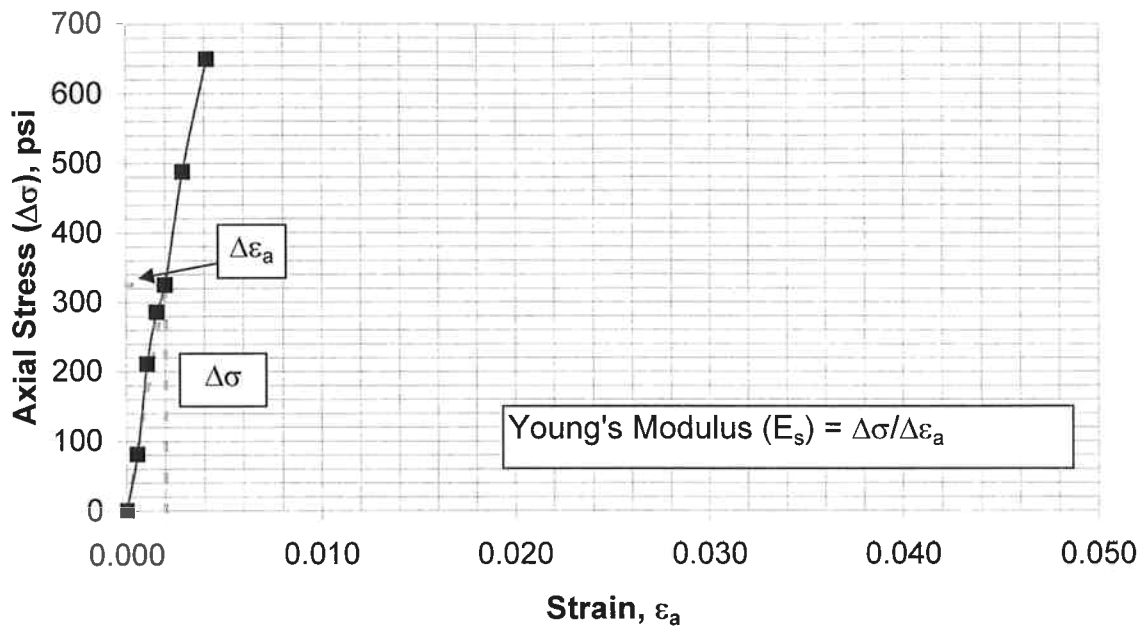
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T5
Run No	RUN-2
Depth	15.5 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	650 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.63E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

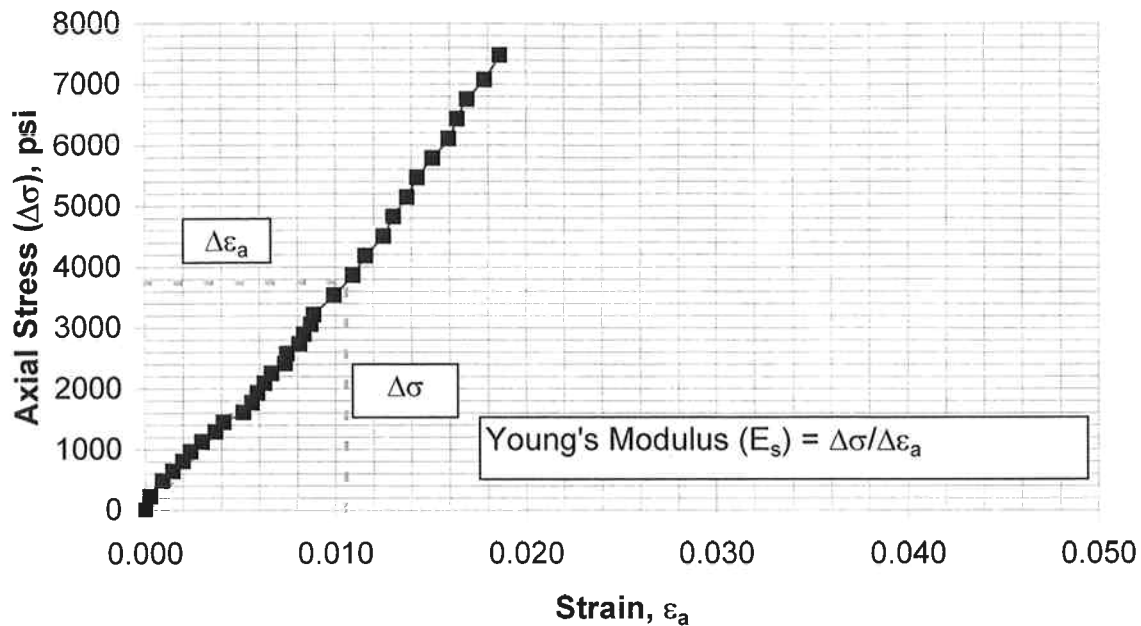
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T5	
Run No	RUN-5	
Depth	34	FEET
Diameter, D	2.0	INCH
Length, L	4.0	INCH
L/D Ratio	2.0	
Temperature During Testing	68	°F
Axial Stress at Failure	7480	PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.55E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

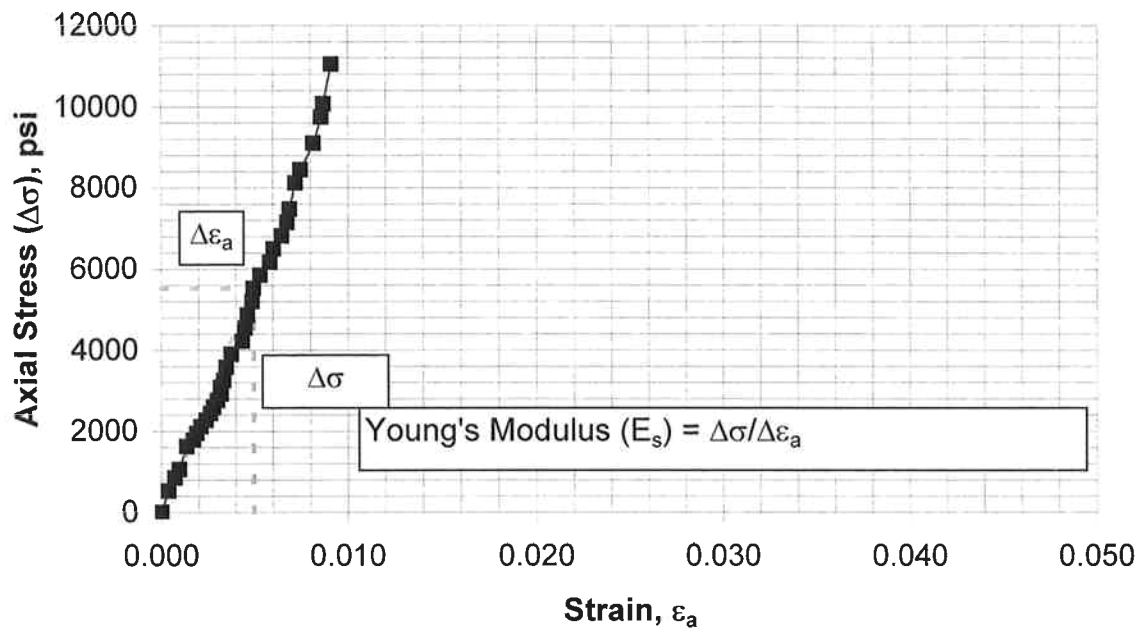
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T5
Run No	RUN-9
Depth	54.5 FEET
Diameter, D	2.0 INCH
Length, L	3.7 INCH
L/D Ratio	1.8
Temperature During Testing	68 °F
Axial Stress at Failure	11040 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.11E+06	PSI
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Description:

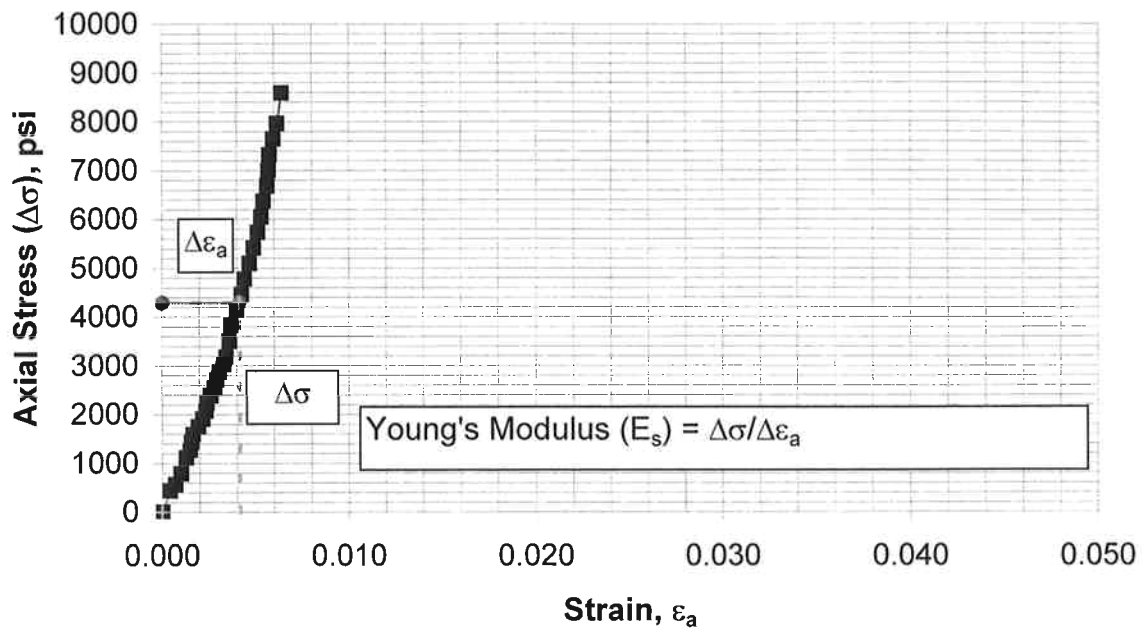
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/11/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T5
Run No	RUN-13
Depth	70.5 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	8580 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.04E+06	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

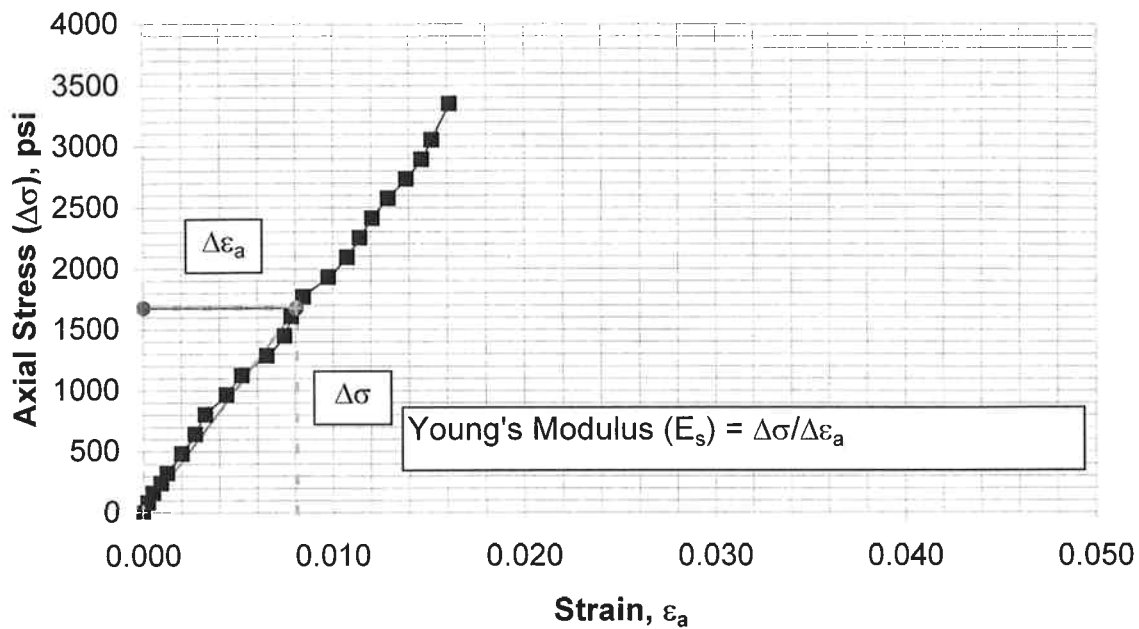
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T6
Run No	RUN-1
Depth	18.5 FEET
Diameter, D	2.0 INCH
Length, L	3.7 INCH
L/D Ratio	1.9
Temperature During Testing	68 °F
Axial Stress at Failure	3350 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.08E+05	PSI
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Description:

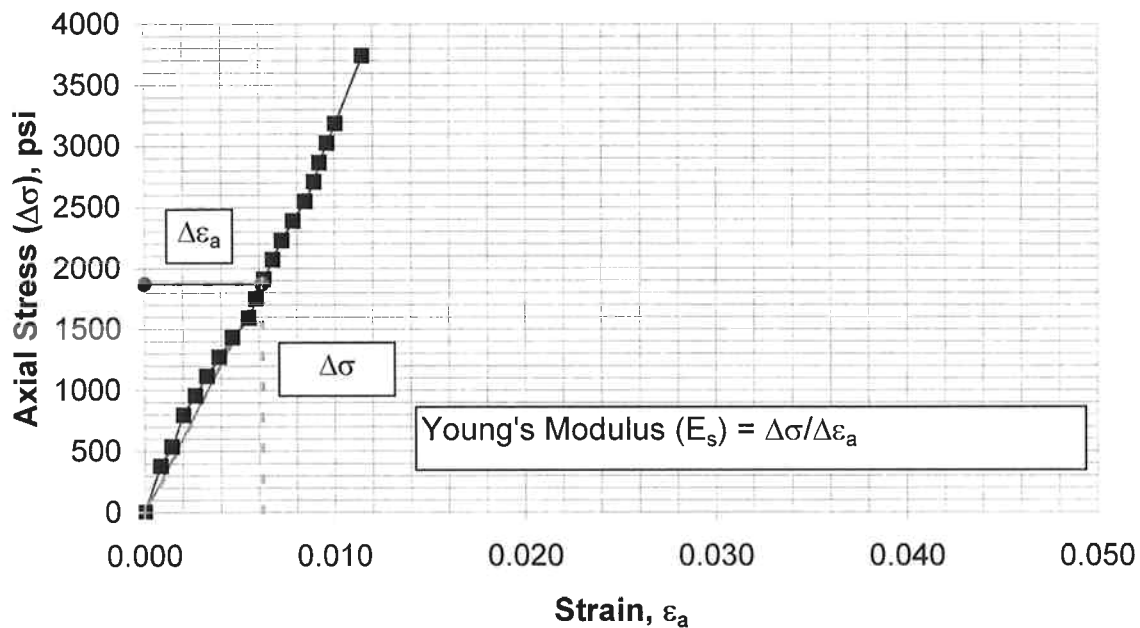
Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD Date: 6/2/07
Project No.: 07503-04 Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	SS/T6
Run No	RUN-2
Depth	20 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3740 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.03E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

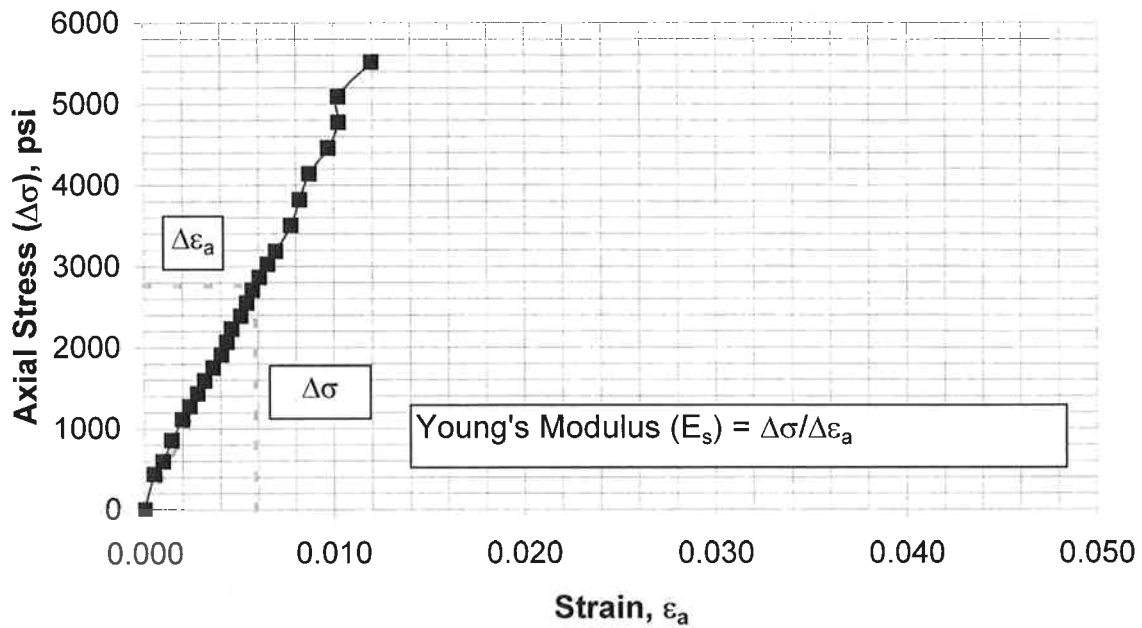
Date: 5/16/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 3
Run No	RUN-2
Depth	13.8 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	5520 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.74E+05	PSI
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Description:

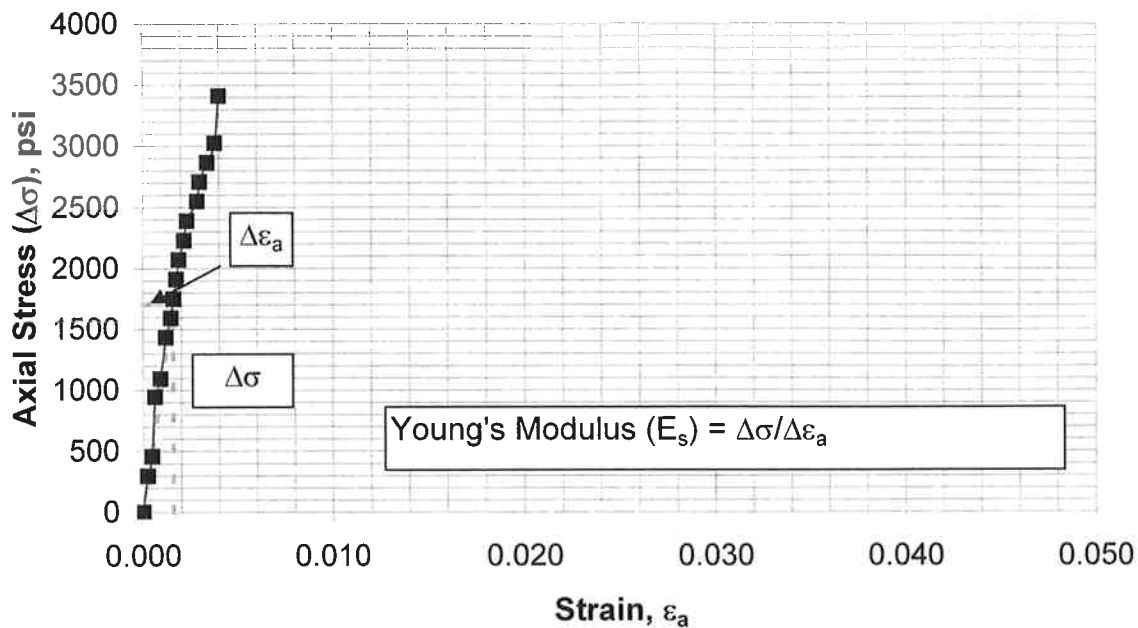
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	5/16/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 3
Run No	RUN-5
Depth	28.5 FEET
Diameter, D	2.0 INCH
Length, L	4.2 INCH
L/D Ratio	2.1
Temperature During Testing	68 °F
Axial Stress at Failure	3410 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.10E+06	PSI
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Description:

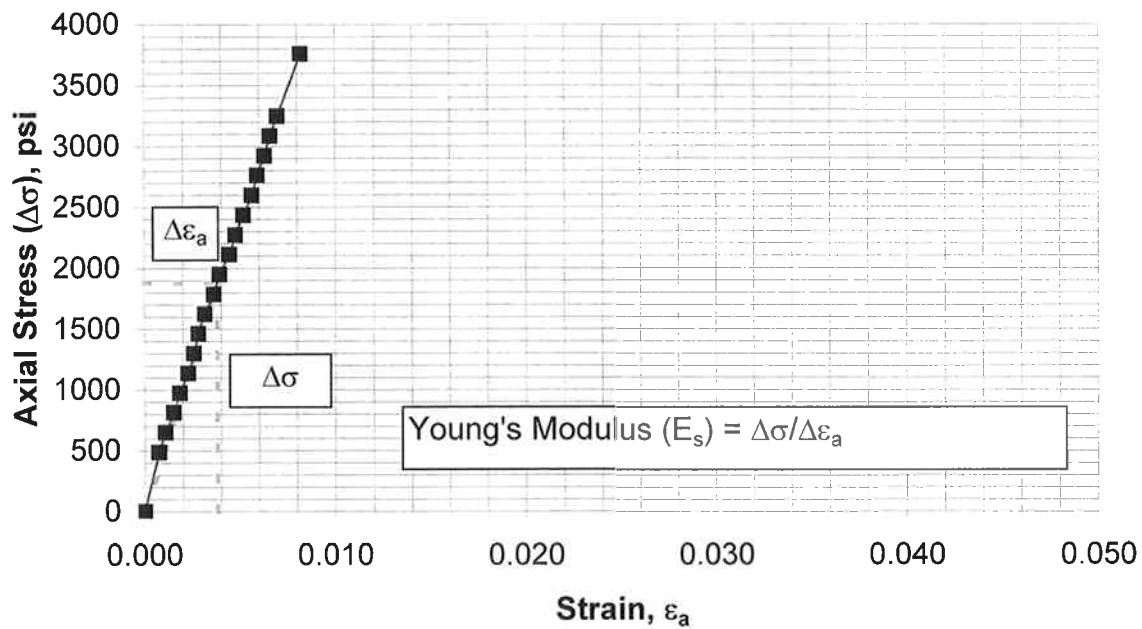
Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD Date: 6/2/07
Project No.: 07503-04 Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 3
Run No	RUN-9
Depth	48.5 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	3760 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.96E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

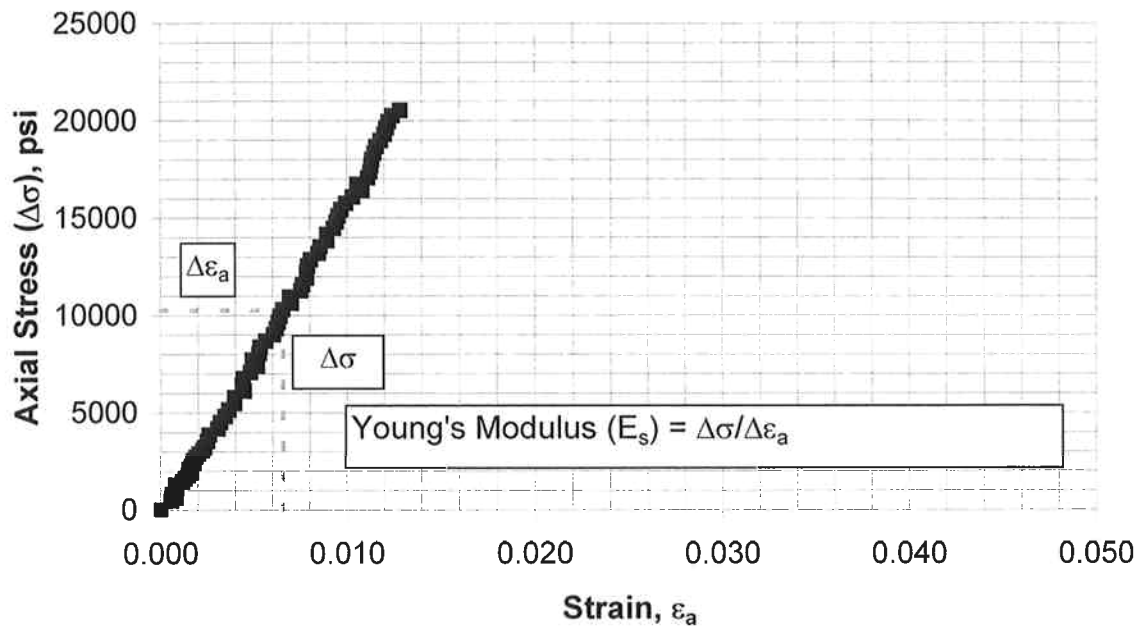
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 3
Run No	RUN-13
Depth	65.5 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	20510 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.57E+06	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

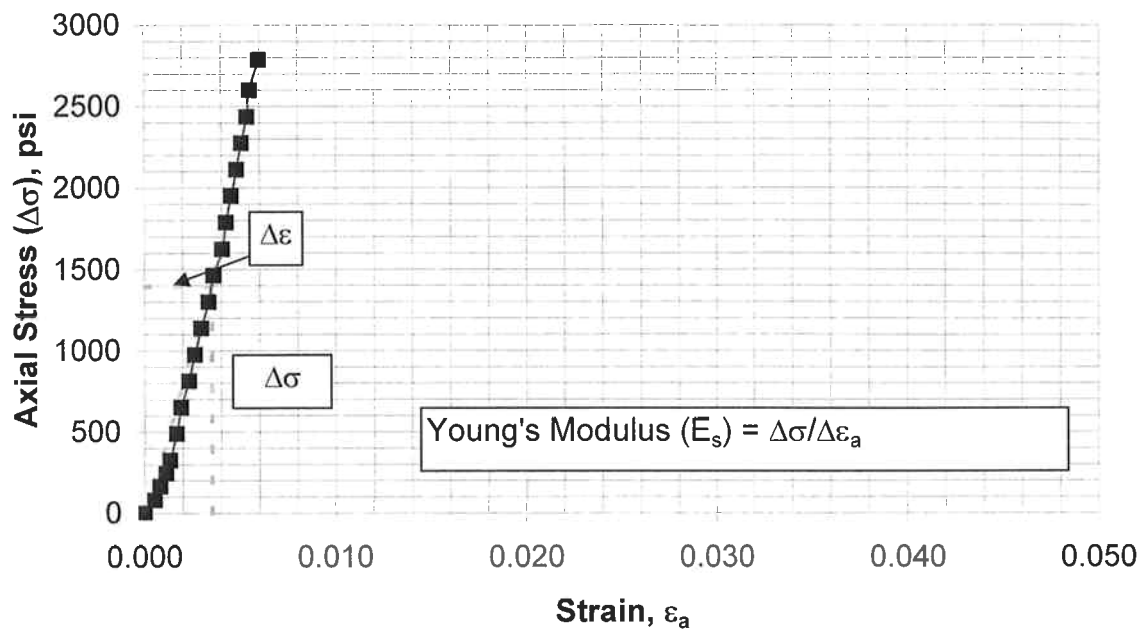
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 4
Run No	RUN-2
Depth	28.5 FEET
Diameter, D	2.0 INCH
Length, L	3.6 INCH
L/D Ratio	1.8
Temperature During Testing	68 °F
Axial Stress at Failure	2790 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.99E+05	PSI
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Description:

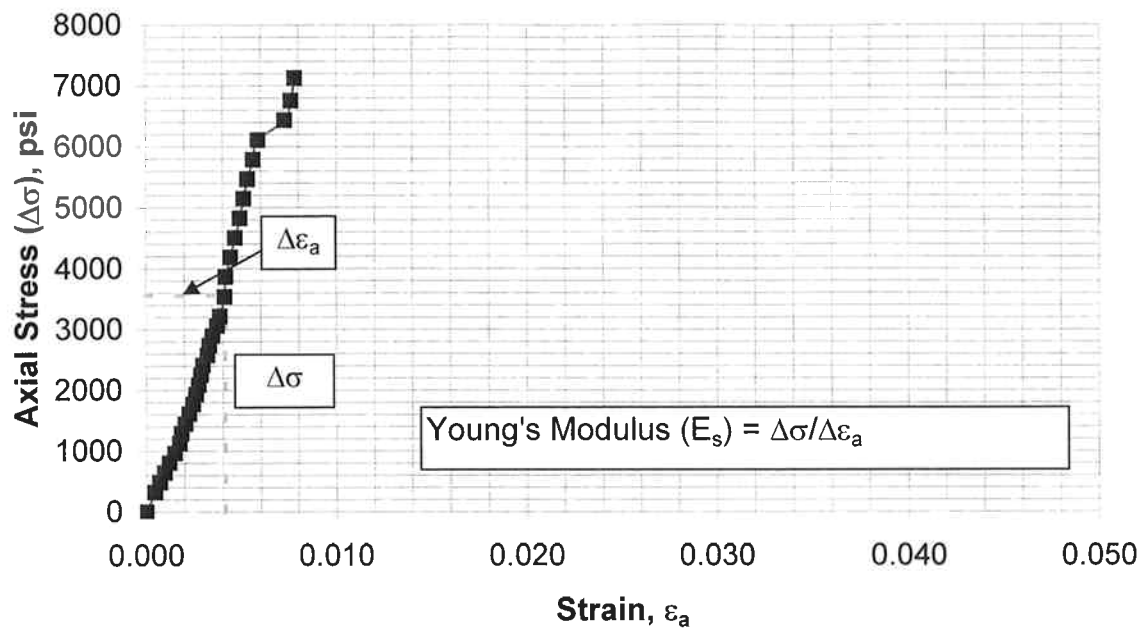
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 4
Run No	RUN-4
Depth	35 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	7120 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	8.66E+05	PSI
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Description:

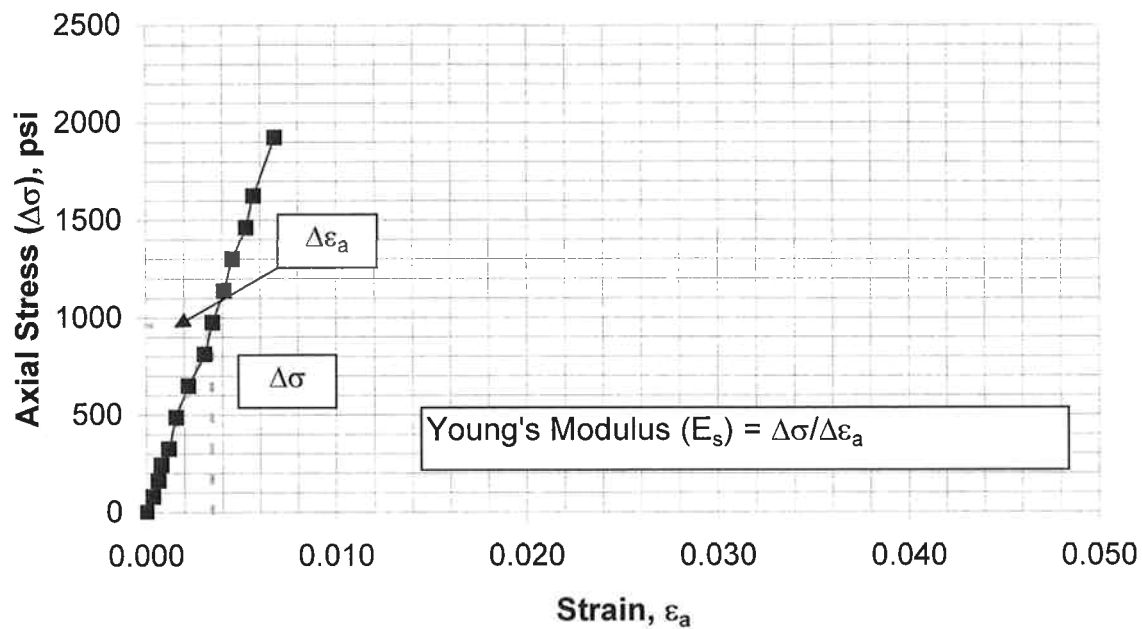
Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD Date: 6/2/07
Project No.: 07503-04 Figure:

UNIAXIAL COMPRESSION OF ROCK CORE



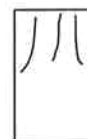


Boring No.	Wayne 4
Run No	RUN-6
Depth	47 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	1920 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	2.79E+05	PSI
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Description:

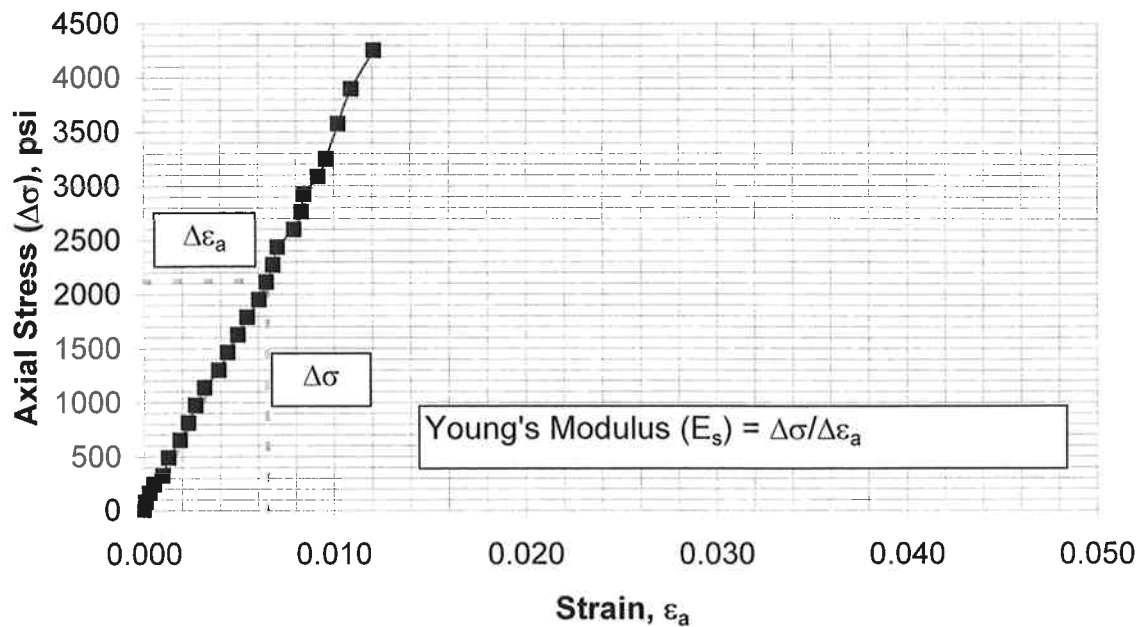
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 4
Run No	RUN-10
Depth	68.1 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	4250 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	3.30E+05	PSI
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Description:

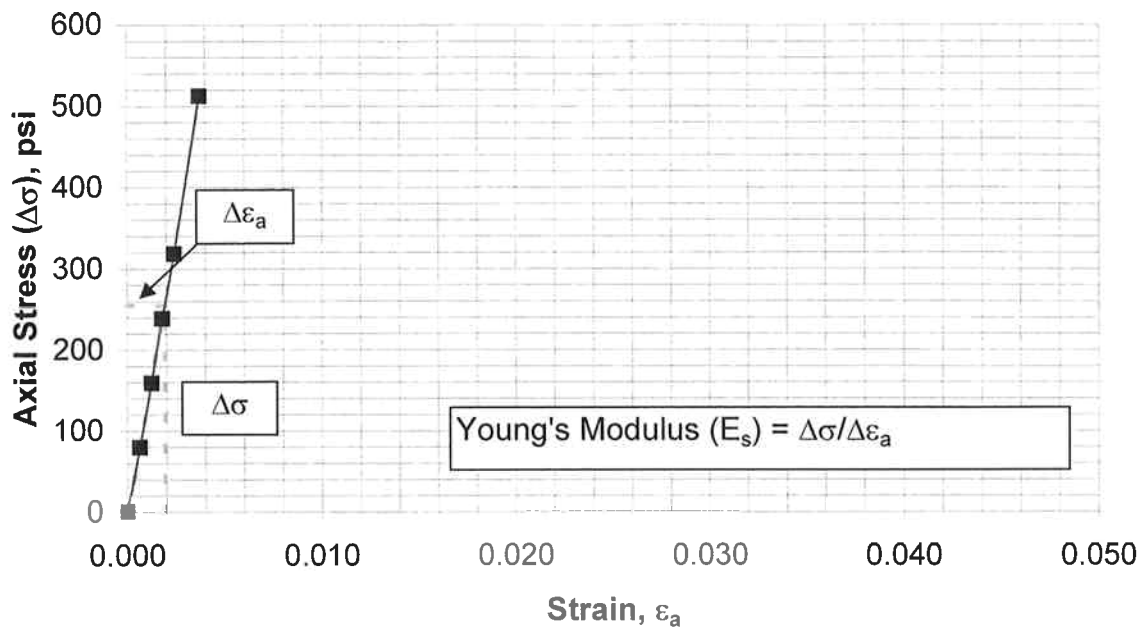
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 4
Run No	RUN-14
Depth	87 FEET
Diameter, D	2.0 INCH
Length, L	4.1 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	510 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.34E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

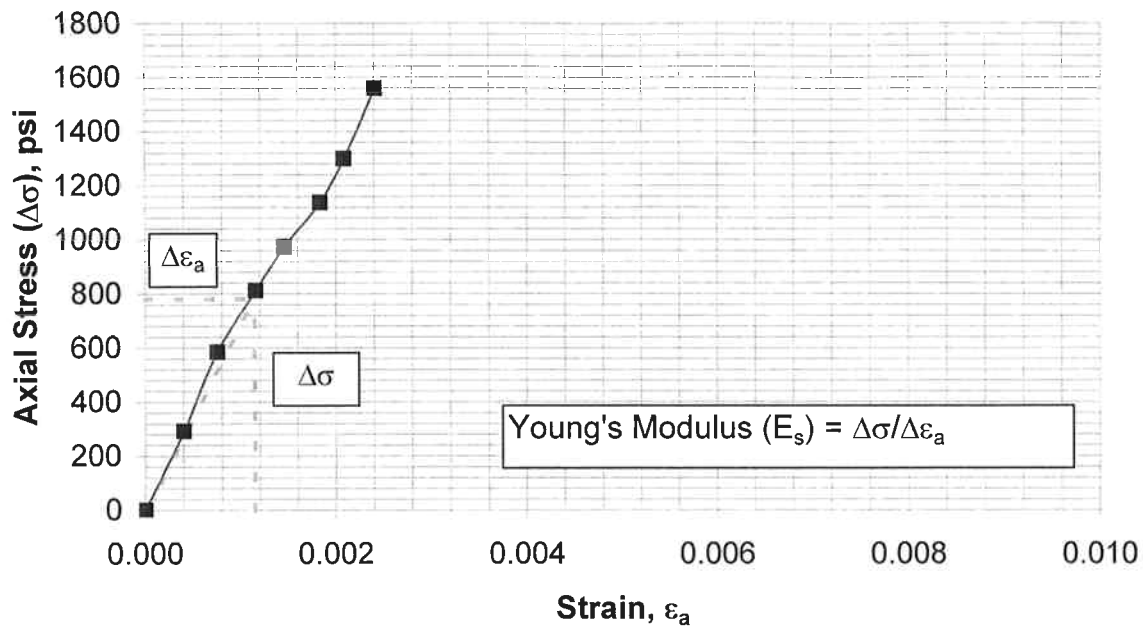
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 5
Run No	RUN-2
Depth	19 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	1560 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	6.82E+05	PSI
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Description:

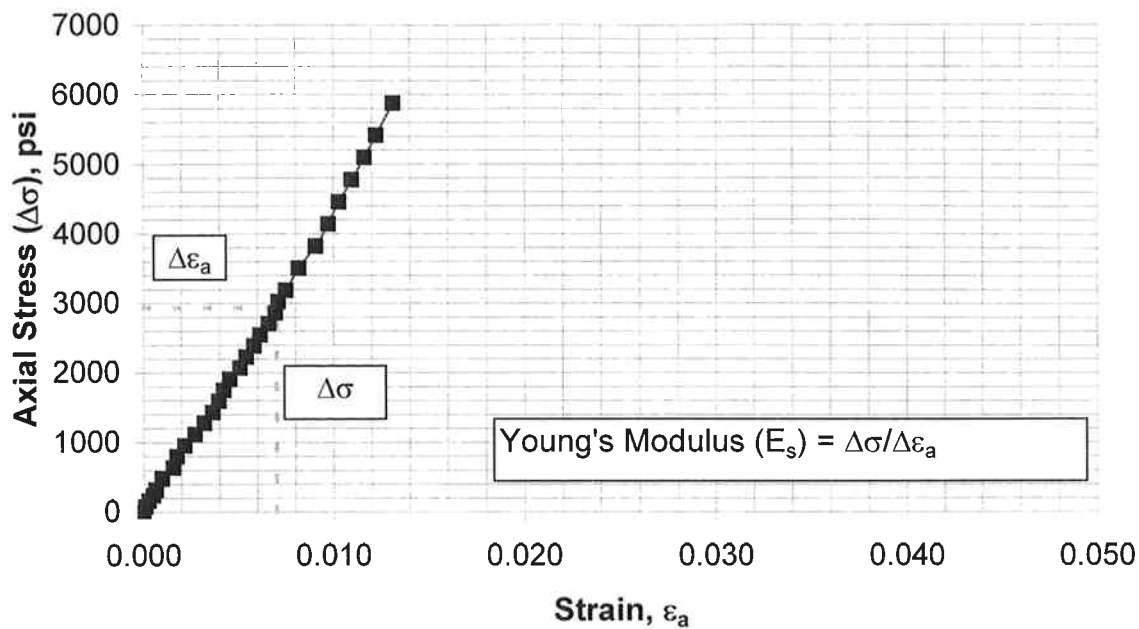
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 5
Run No	RUN-4
Depth	27 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	5870 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	4.19E+05	PSI
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Description:

Sketch at Failure:



Project Name: Purple Line, Silver Spring, MD

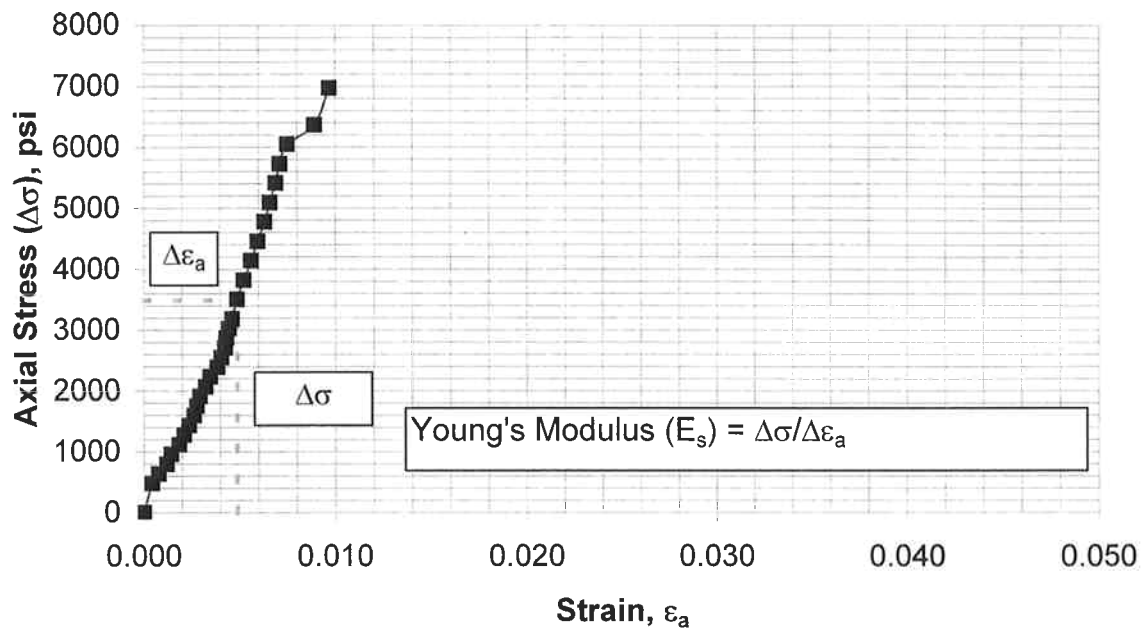
Date: 6/2/07

Project No.: 07503-04

Figure:

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 5
Run No	RUN-5
Depth	30 FEET
Diameter, D	2.0 INCH
Length, L	4.0 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	6970 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	7.13E+05	PSI
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Description:

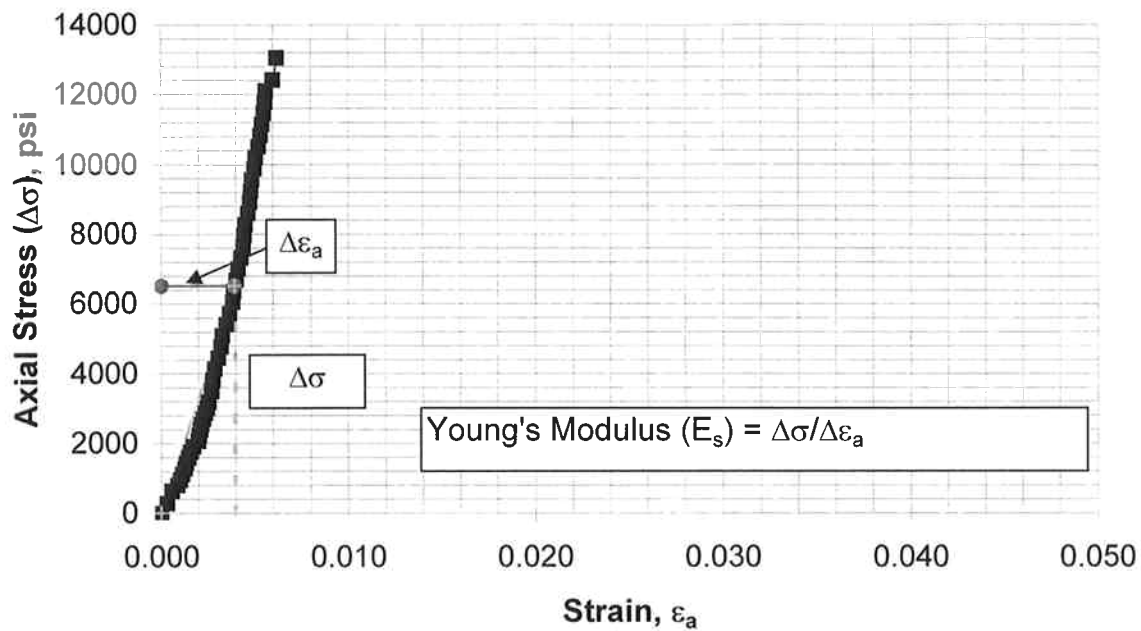
Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/11/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE





Boring No.	Wayne 5
Run No	RUN-9
Depth	50 FEET
Diameter, D	2.0 INCH
Length, L	3.9 INCH
L/D Ratio	2.0
Temperature During Testing	68 °F
Axial Stress at Failure	13040 PSI

Young's Modulus (E_s) @ 50% of Ultimate Strength (Secant Modulus)	1.65E+06	PSI
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Description:

Sketch at Failure:



Project Name:	Purple Line, Silver Spring, MD	Date:	6/2/07
Project No.:	07503-04	Figure:	

UNIAXIAL COMPRESSION OF ROCK CORE



UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

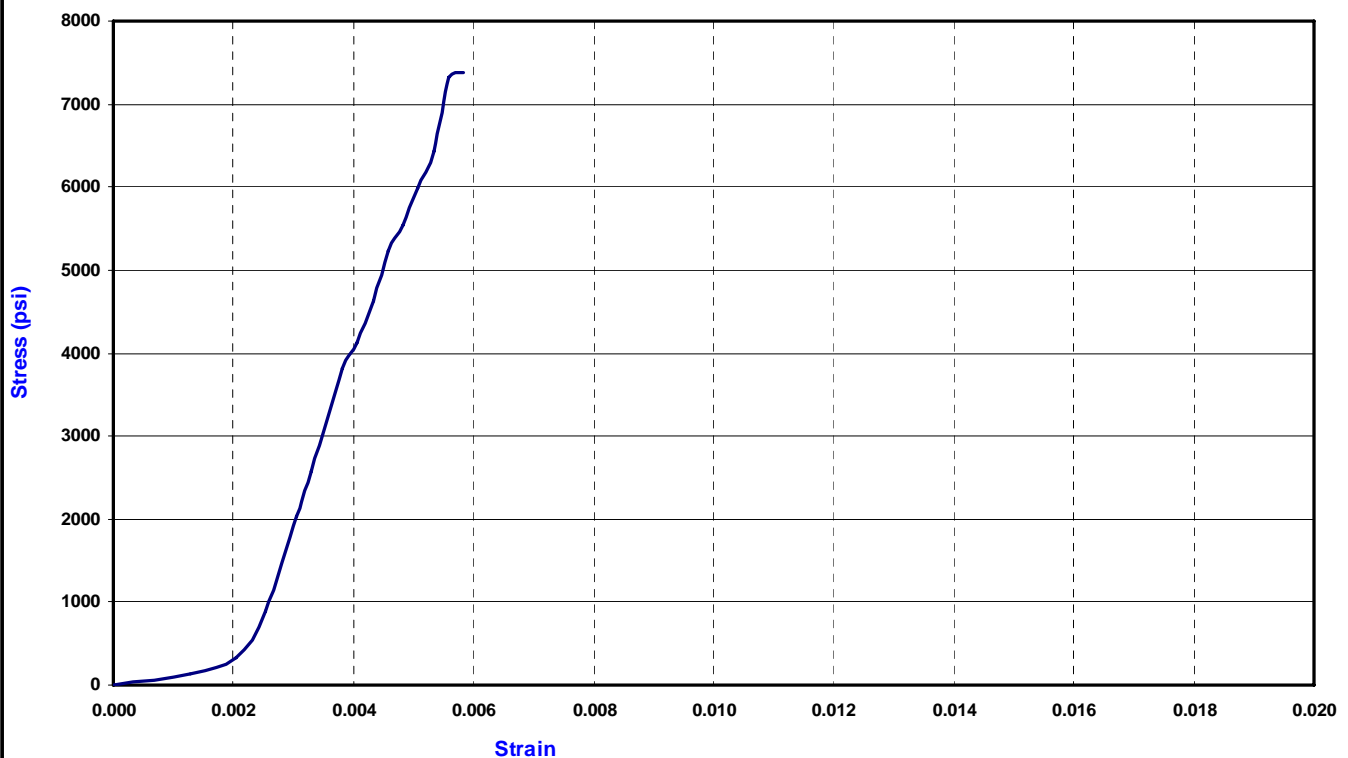
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: MANCHESTER-1, R-6 @ 78.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.936	1.990	172.2	1.98	NT	22950	7377	4.5

*NT: Not Tested

REMARKS:

Failure along Joint.



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

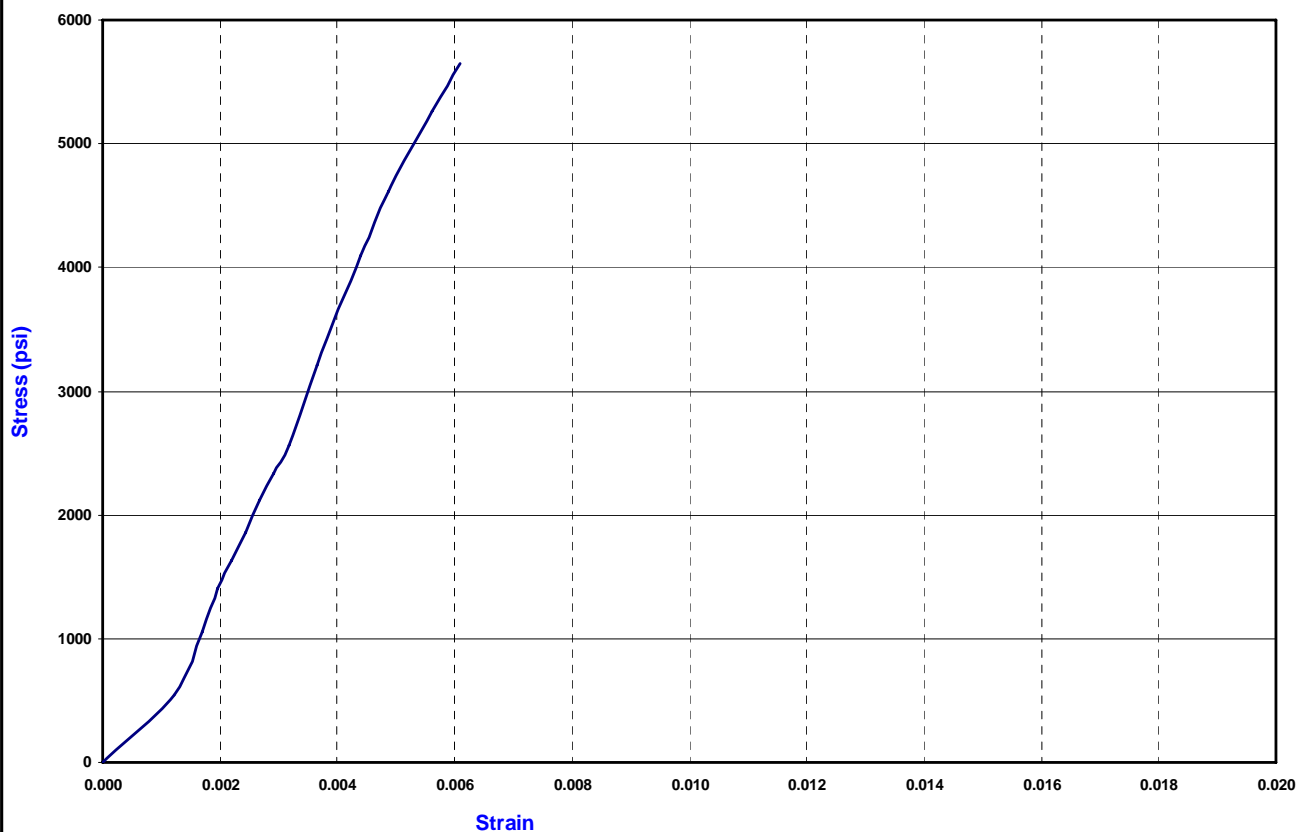
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: MAN-2, R-7 @ 60.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
4.101	1.992	164.9	2.06	NT	17600	5644	3.50

*NT: Not Tested

REMARKS:



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

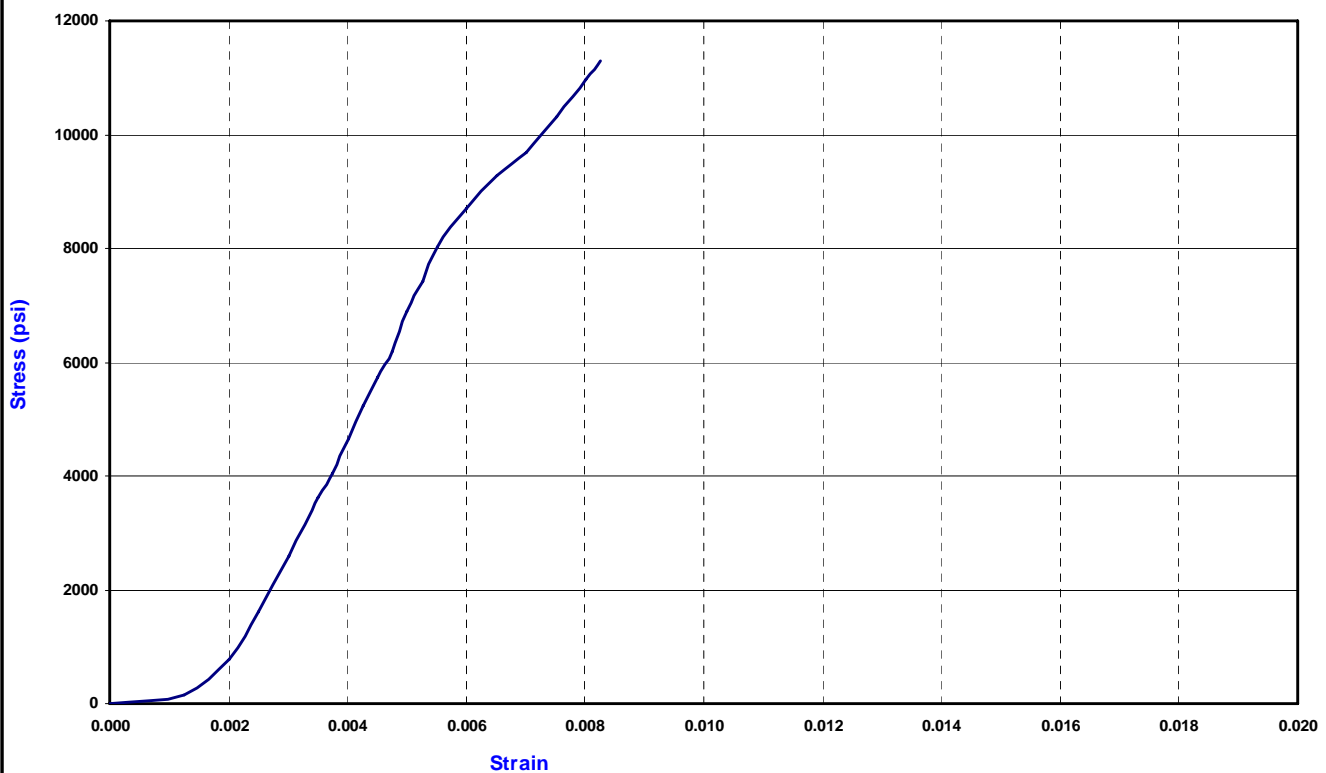
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: MANCHESTER-3, R-7 @ 68.5'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.990	1.987	171.8	2.01	NT	35000	11285	4.0

*NT: Not Tested
REMARKS:



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

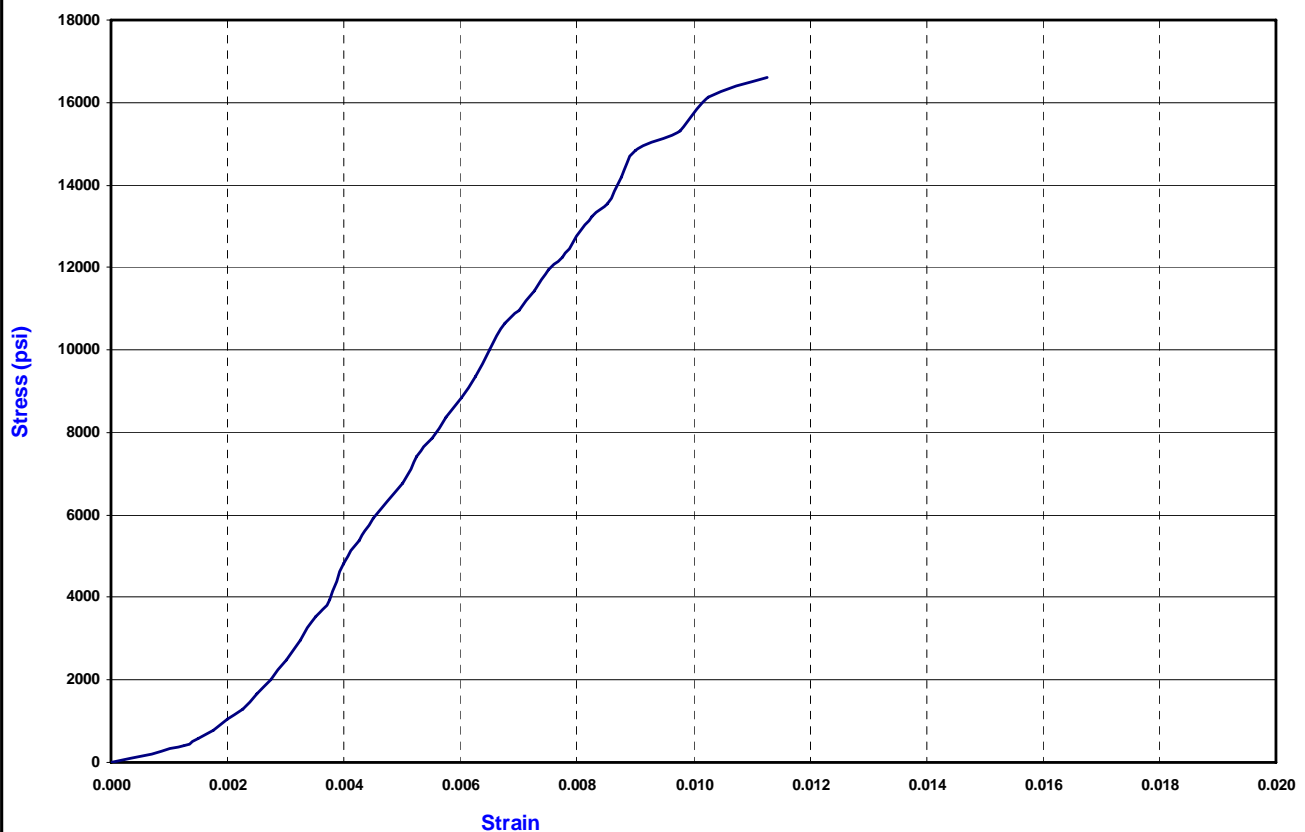
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: MANCHESTER-3, R-12 @ 94'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.995	1.987	171.5	2.01	NT	51500	16606	5.0

*NT: Not Tested

REMARKS:



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

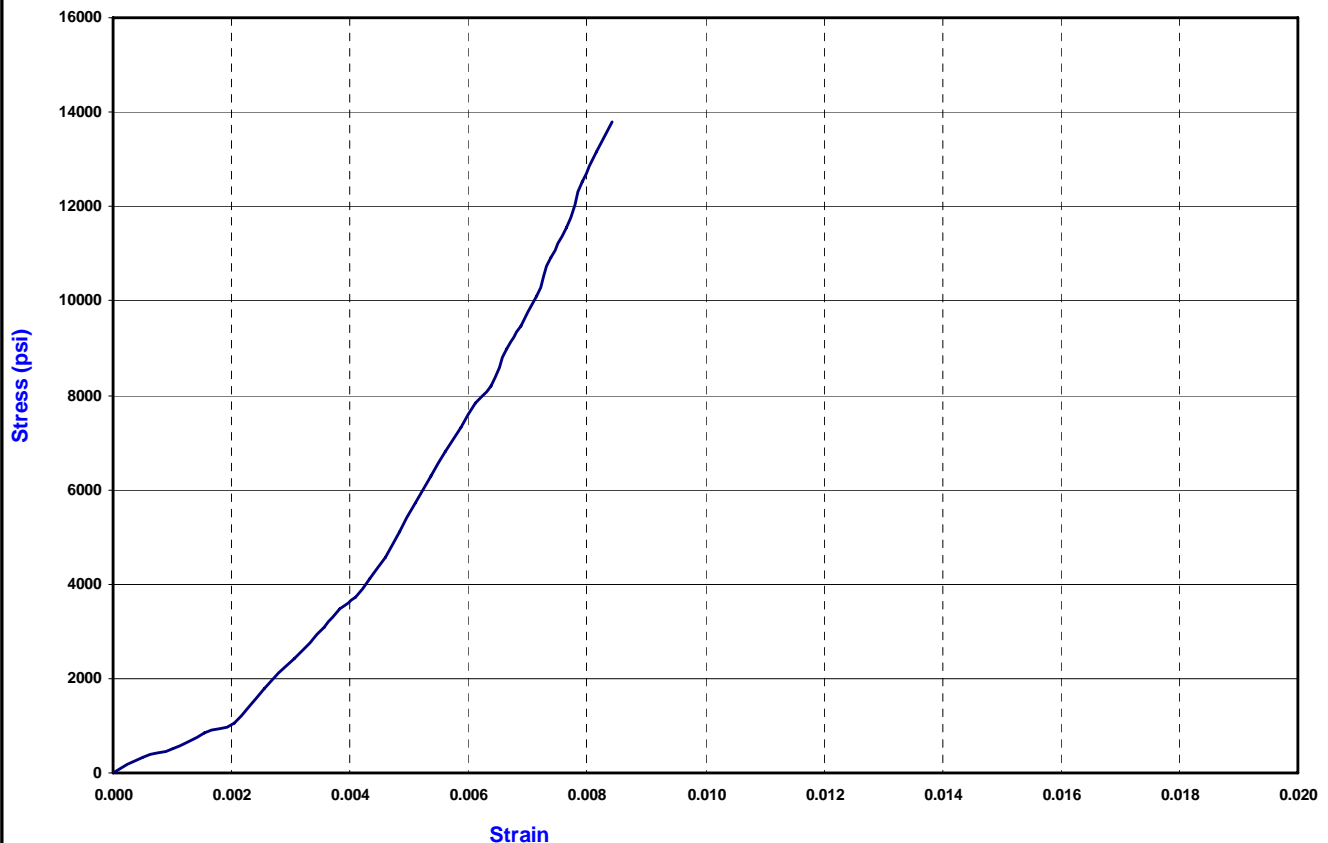
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: MANCHESTER-4, R-7 @ 66.5'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.919	1.992	171.1	1.97	NT	43000	13971	4.7

*NT: Not Tested

REMARKS:



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

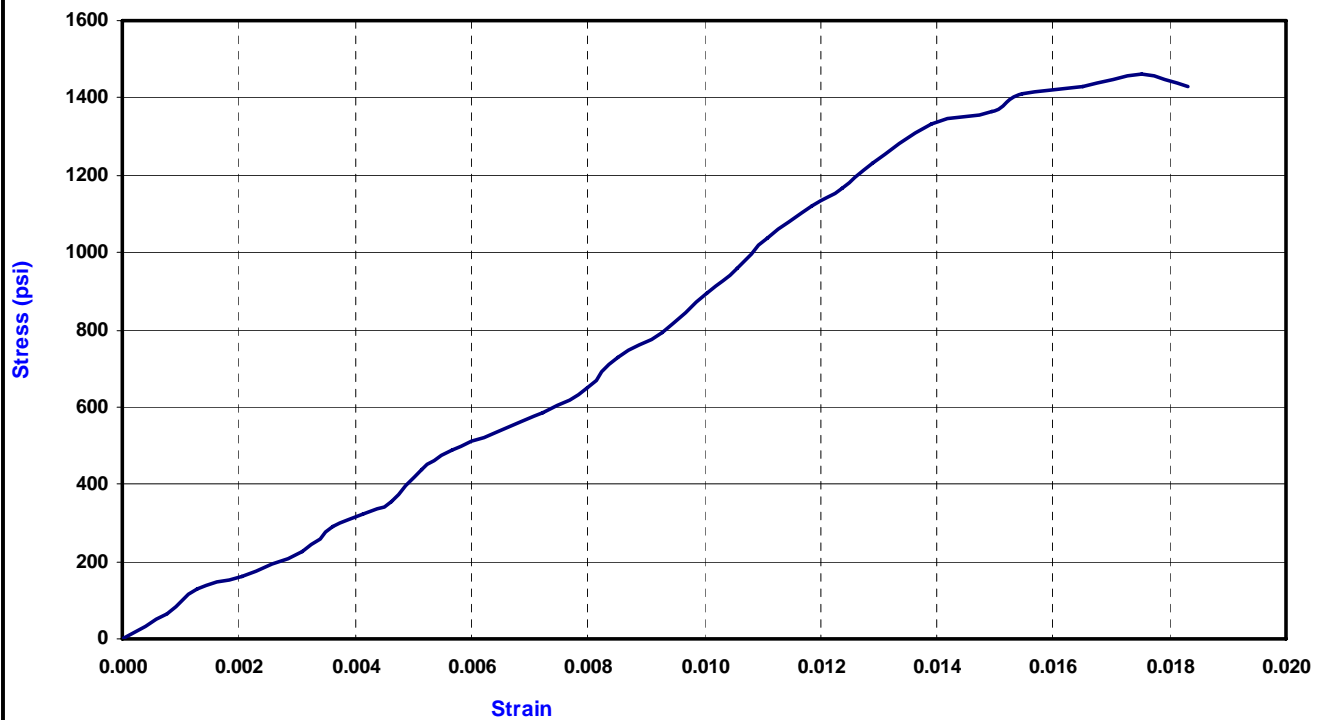
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: PLYMOUTH-2, R-4 @ 64.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.879	1.981	167.7	1.96	NT	4500	1460	4.0

*NT: Not Tested

REMARKS:

Failure along Schistosity plane.



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

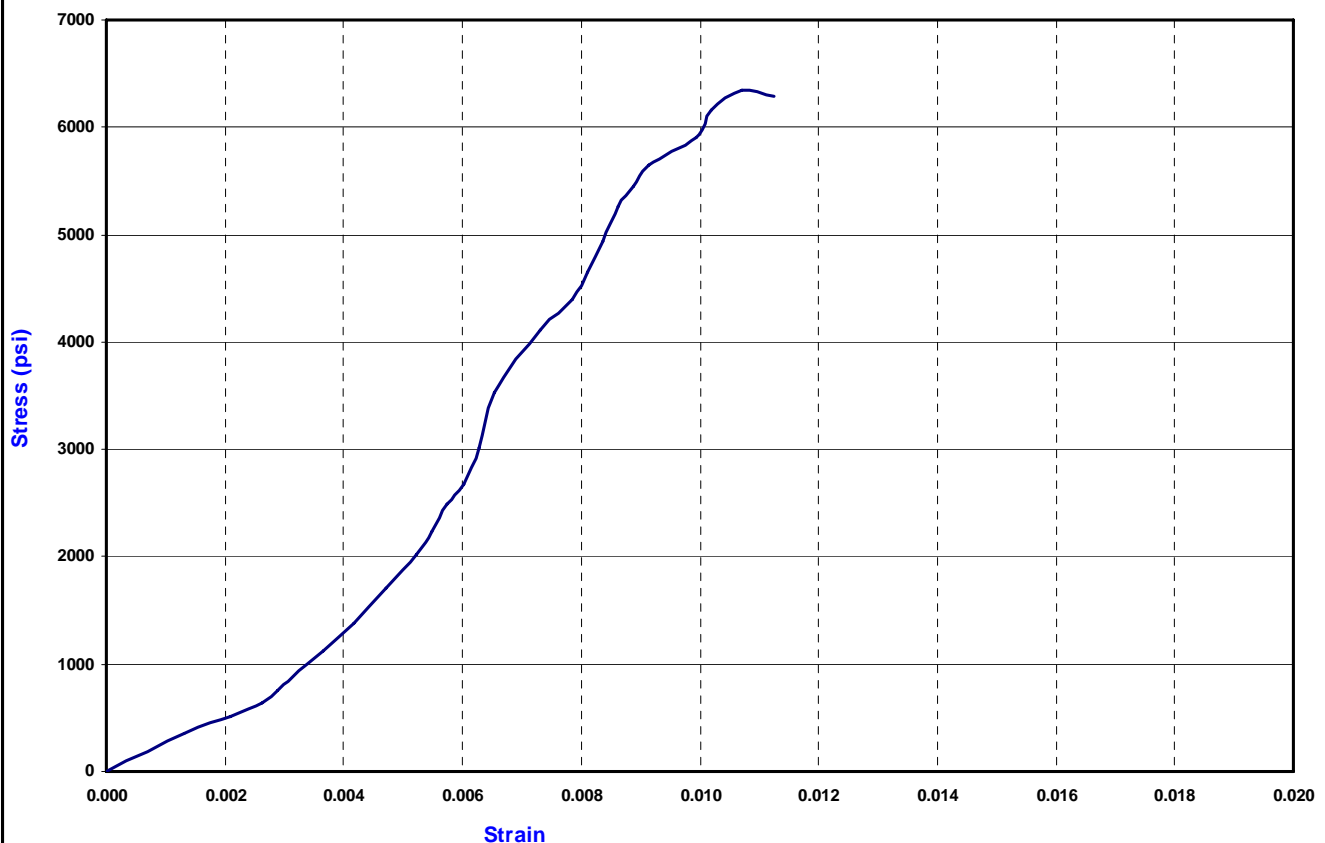
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: PLYMOUTH-2, R-7 @ 75.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.826	1.992	169.5	1.92	NT	19600	6288	5.0

*NT: Not Tested

REMARKS:



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

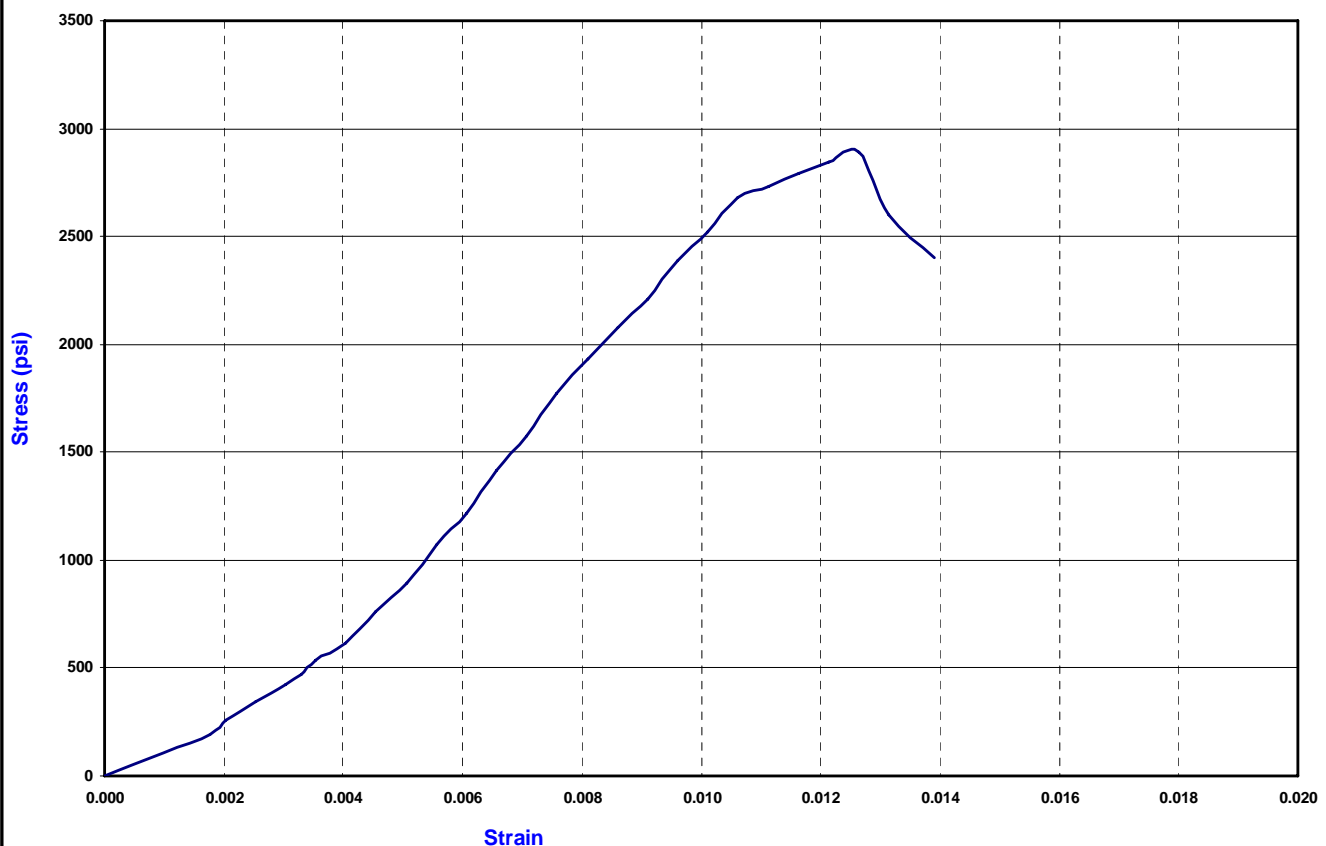
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: SS/T1, R-1 @ 46.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.995	1.979	163.3	2.00	NT	8900	2892	4.0

*NT: Not Tested

REMARKS:

Failure along Joint.



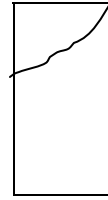
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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

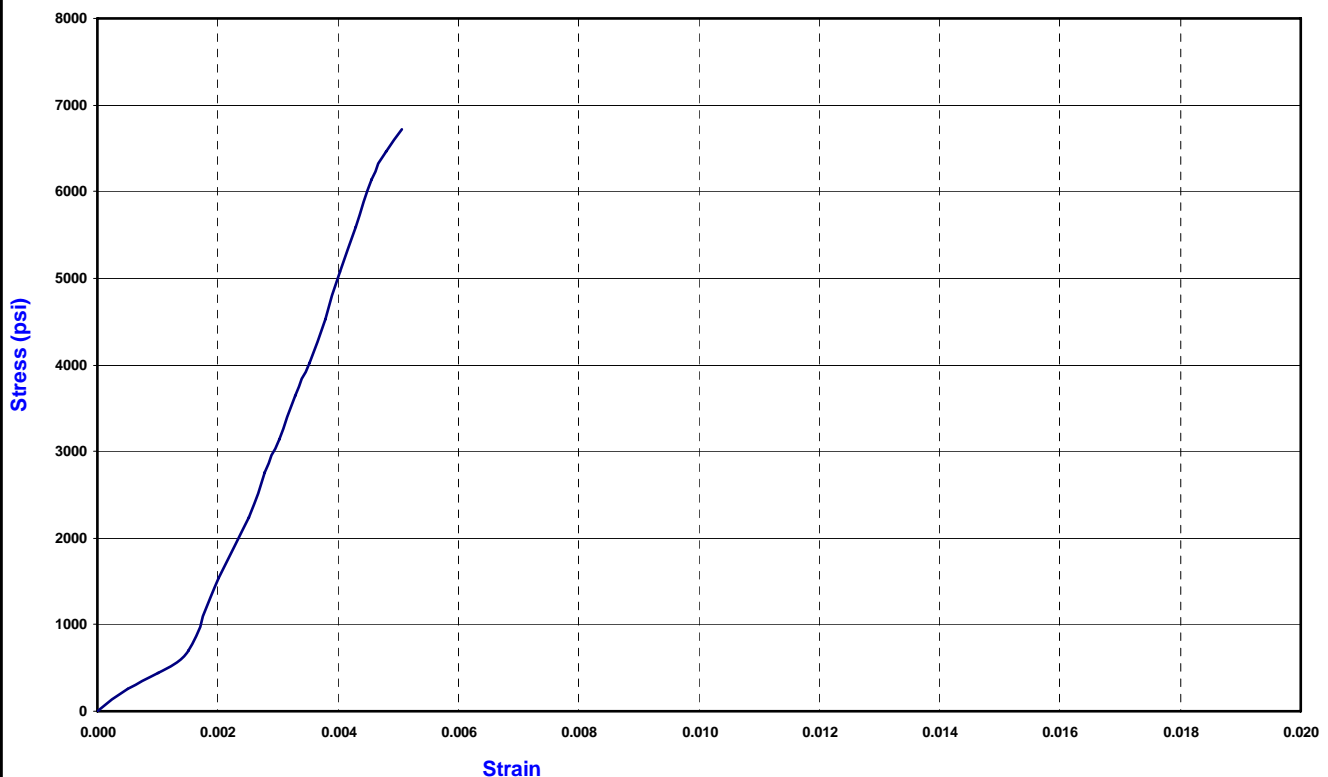
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: SS/T1, R-4 @ 61.5'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.960	1.995	175.9	1.98	NT	21000	6717	3.0

*NT: Not Tested

REMARKS:

Failure along Schistosity plane.



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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

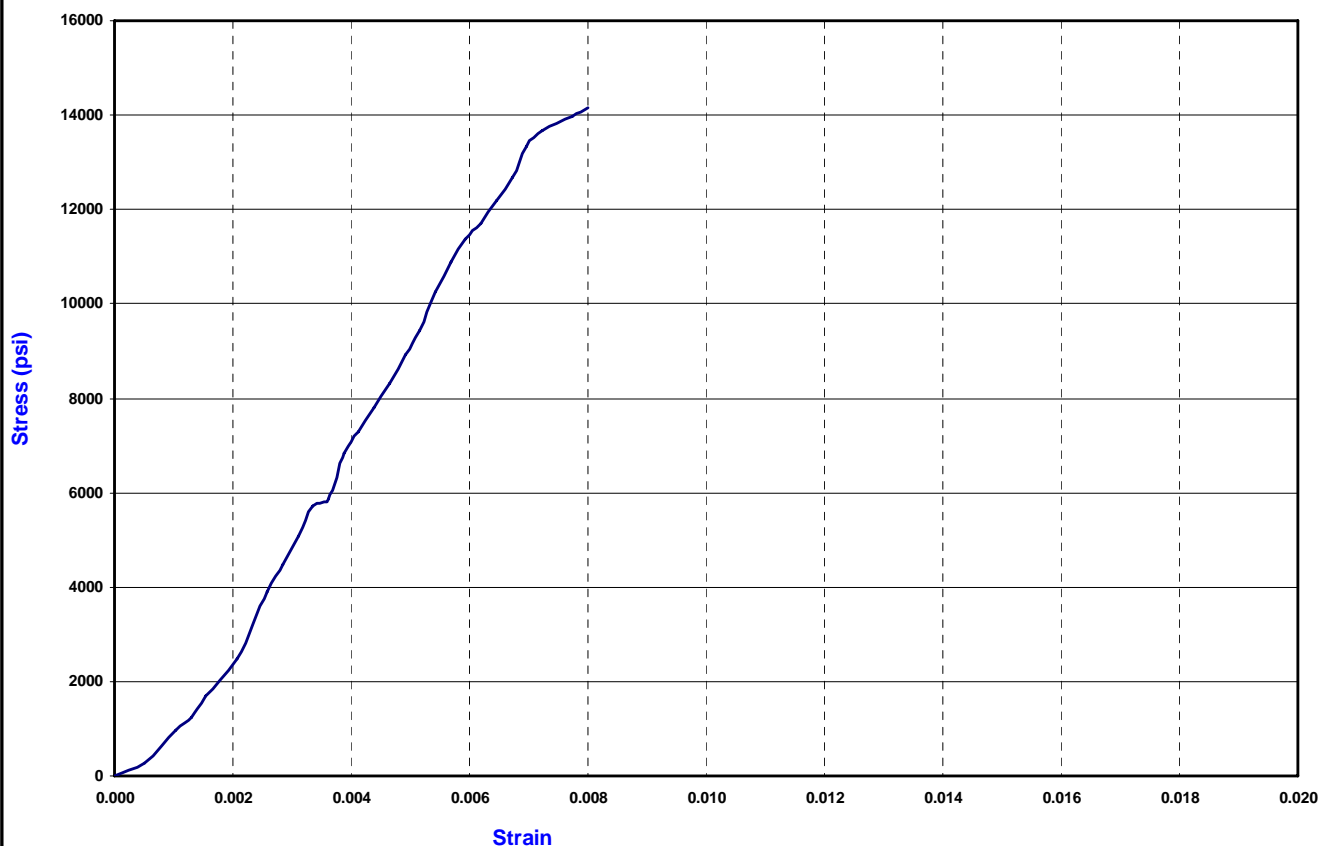
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: SS/T2, R-2 @ 36.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.873	1.978	171.2	1.96	NT	43500	14149	4.5

*NT: Not Tested

REMARKS:



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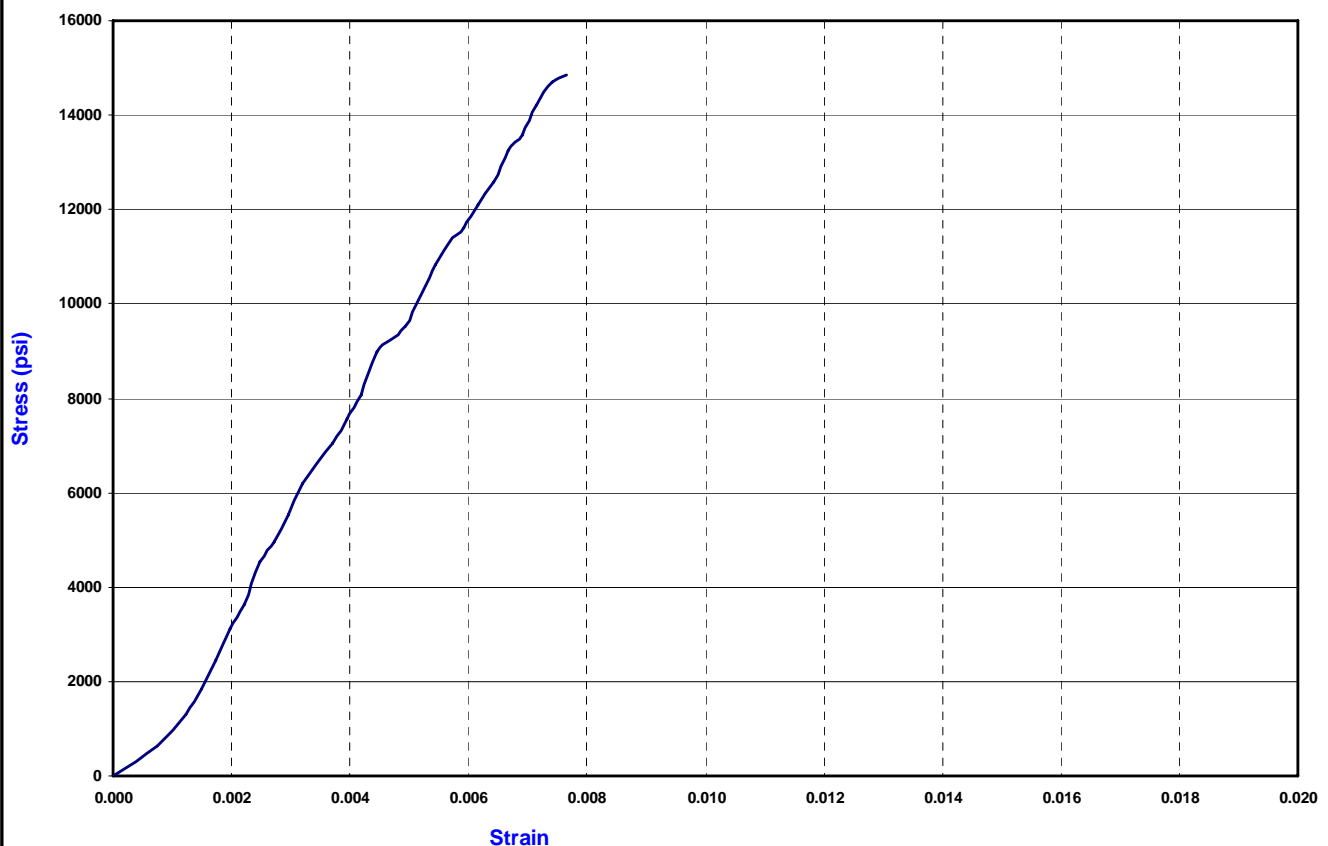
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: SS/T2, R-10 @ 75.8'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
4.053	1.985	173.5	2.04	NT	46000	14857	6.5

*NT: Not Tested

REMARKS:



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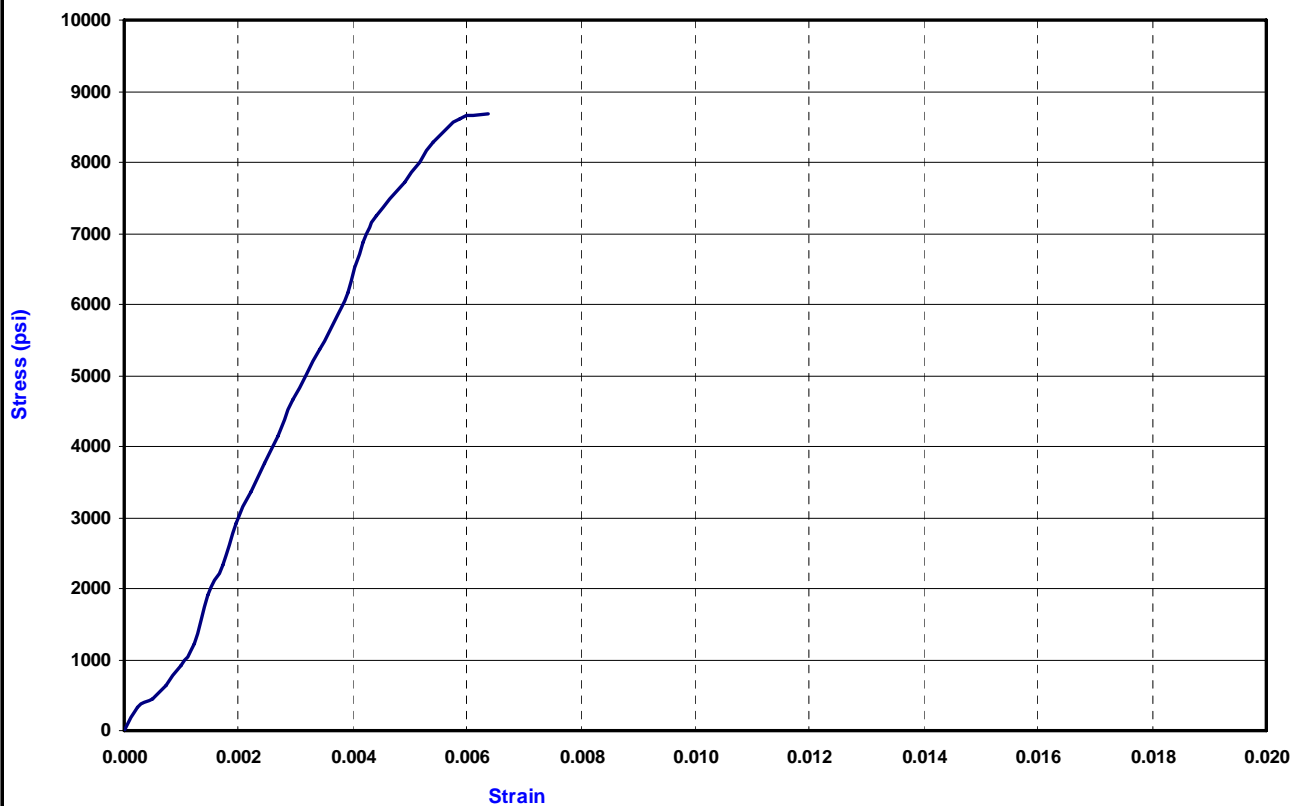
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: SS/T3, R-3 @ 41.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
4.075	1.983	167.5	2.06	NT	26800	8679	3.2

*NT: Not Tested

REMARKS:

Failure along joint.



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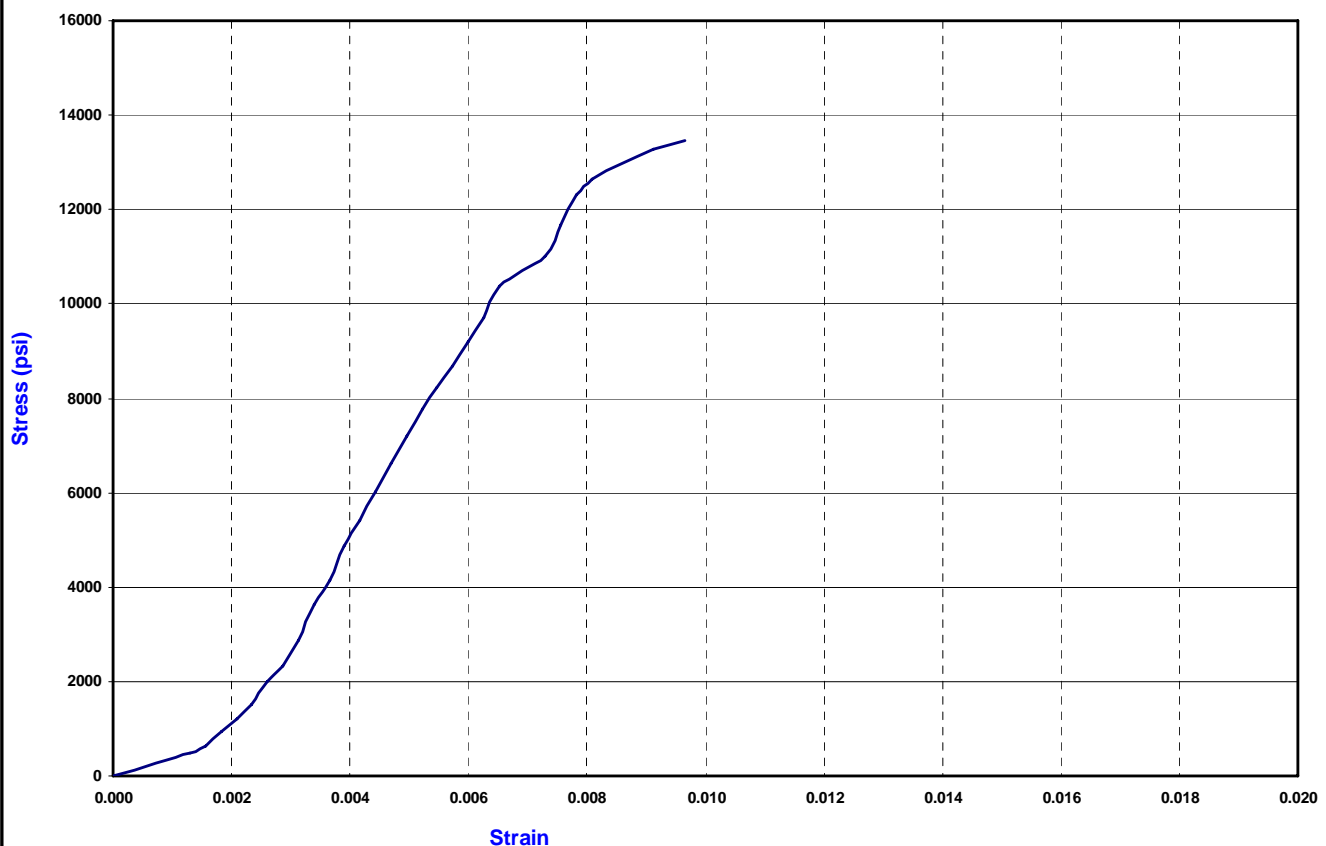
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: SS/T5, R-2 @ 16.5'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.836	1.982	172.2	1.94	NT	41500	13449	5.0

*NT: Not Tested

REMARKS:



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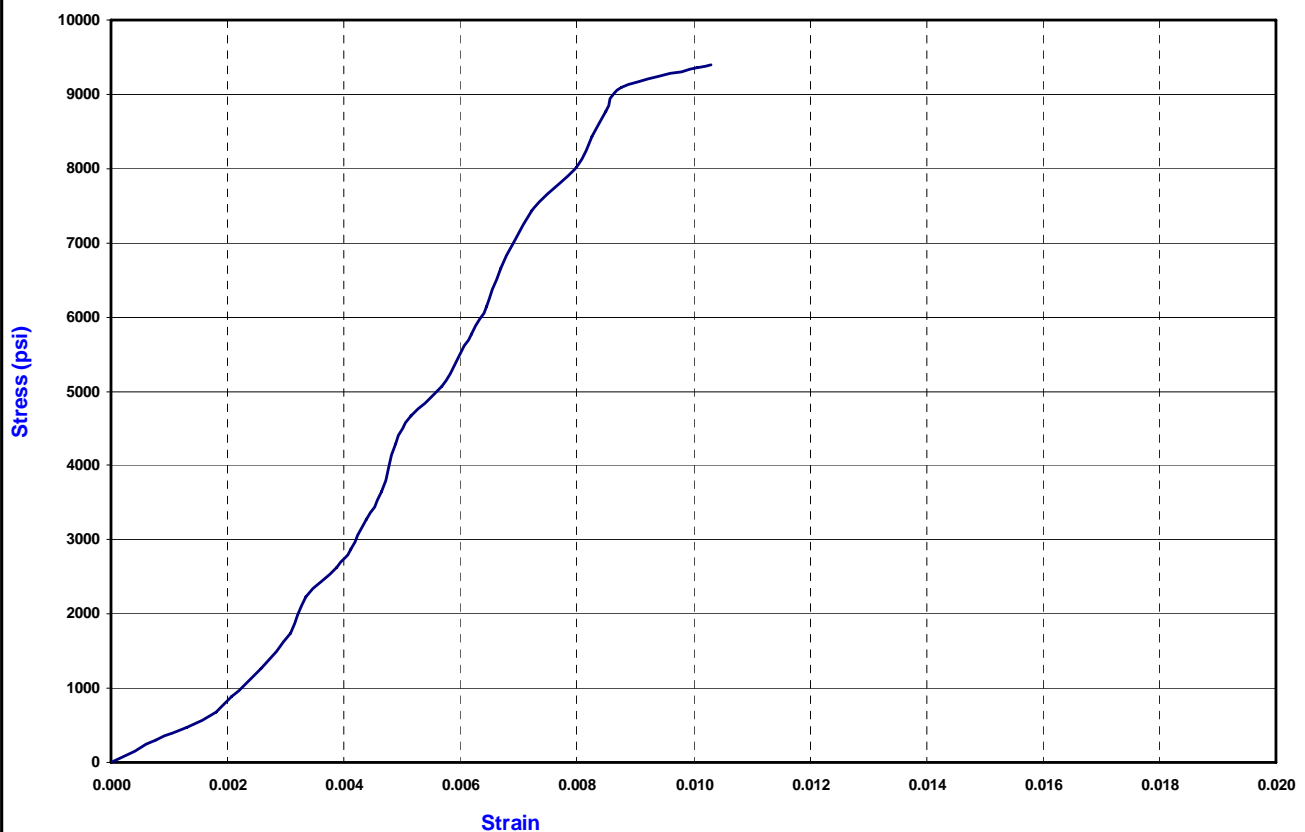
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-3, R-5 @ 28.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.881	1.994	171.1	1.95	NT	29350	9400	5.0

*NT: Not Tested

REMARKS:



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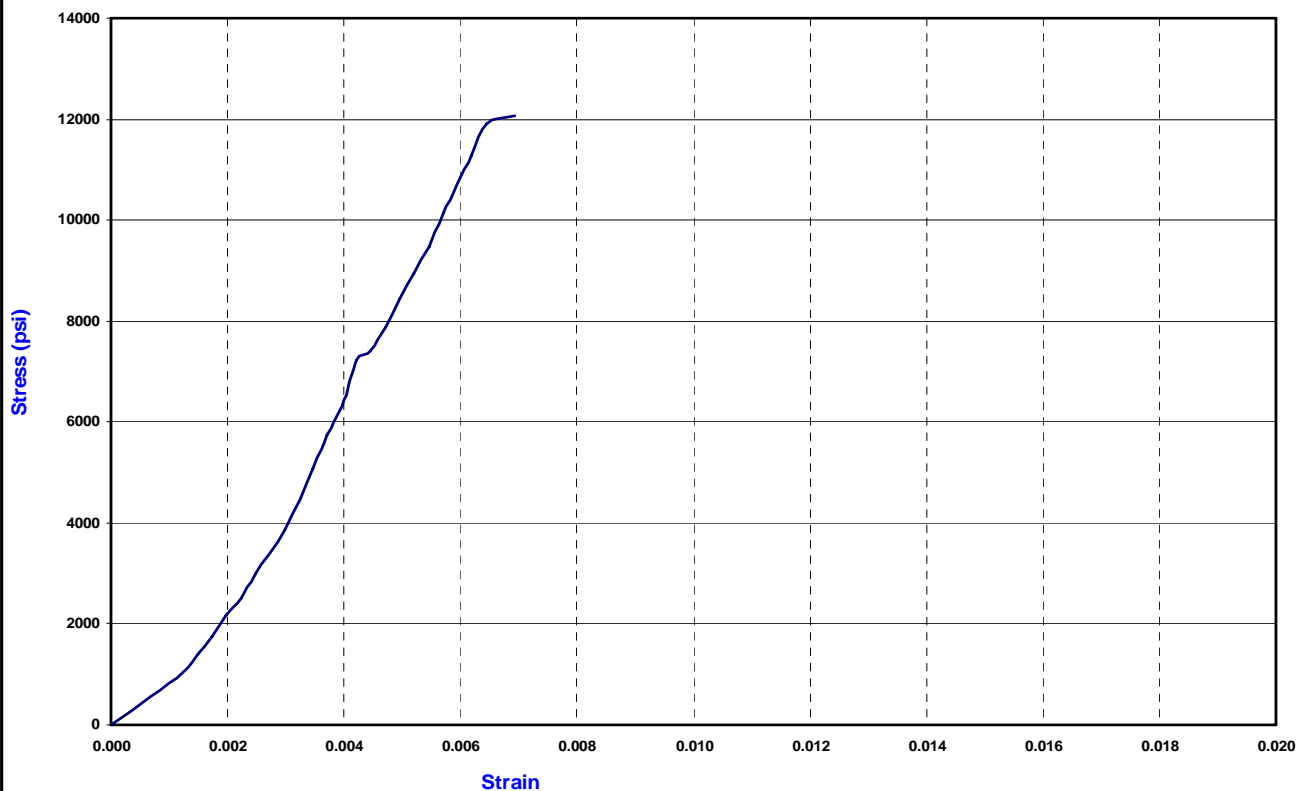
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-3, R-9 @ 49.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
4.035	1.988	172.4	2.03	NT	37500	12079	4.5

*NT: Not Tested

REMARKS:

Failure along Schistosity plane.



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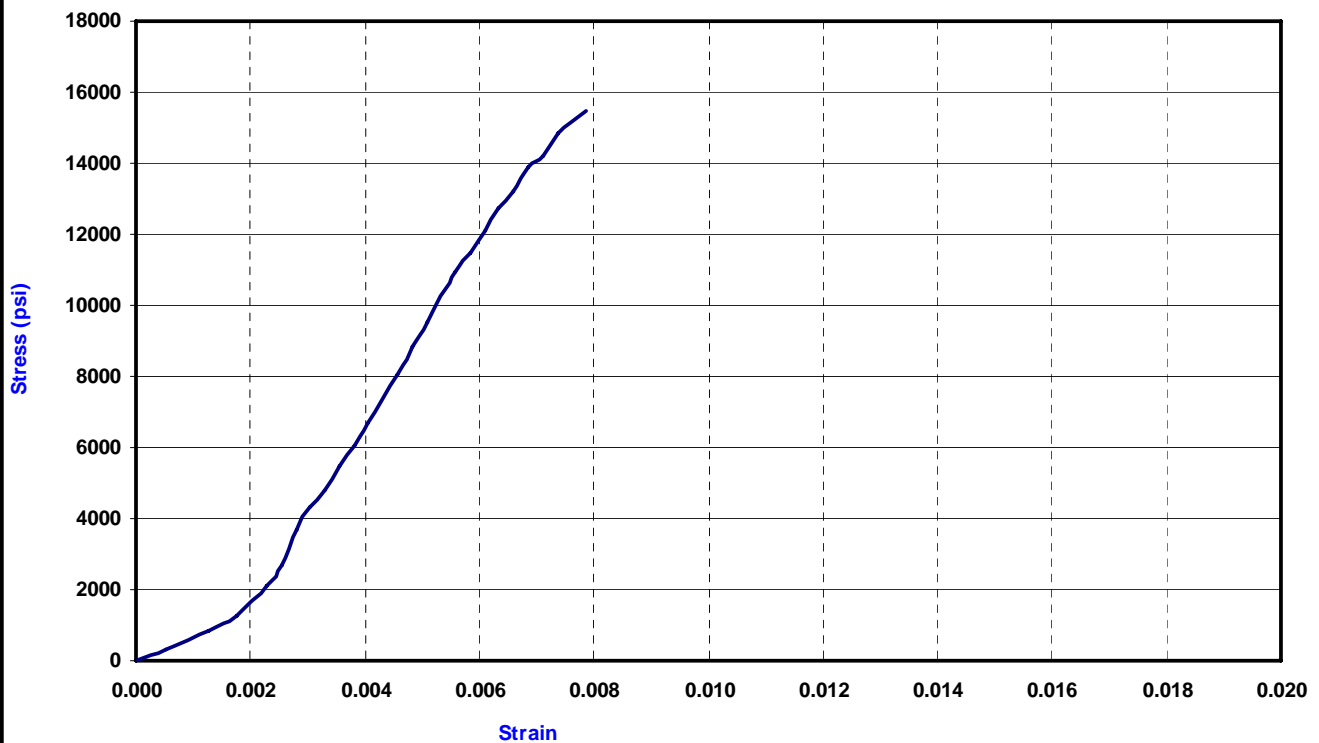
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-3, R-13 @ 66.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.940	1.987	174.0	1.98	NT	48000	15482	4.5

*NT: Not Tested

REMARKS:



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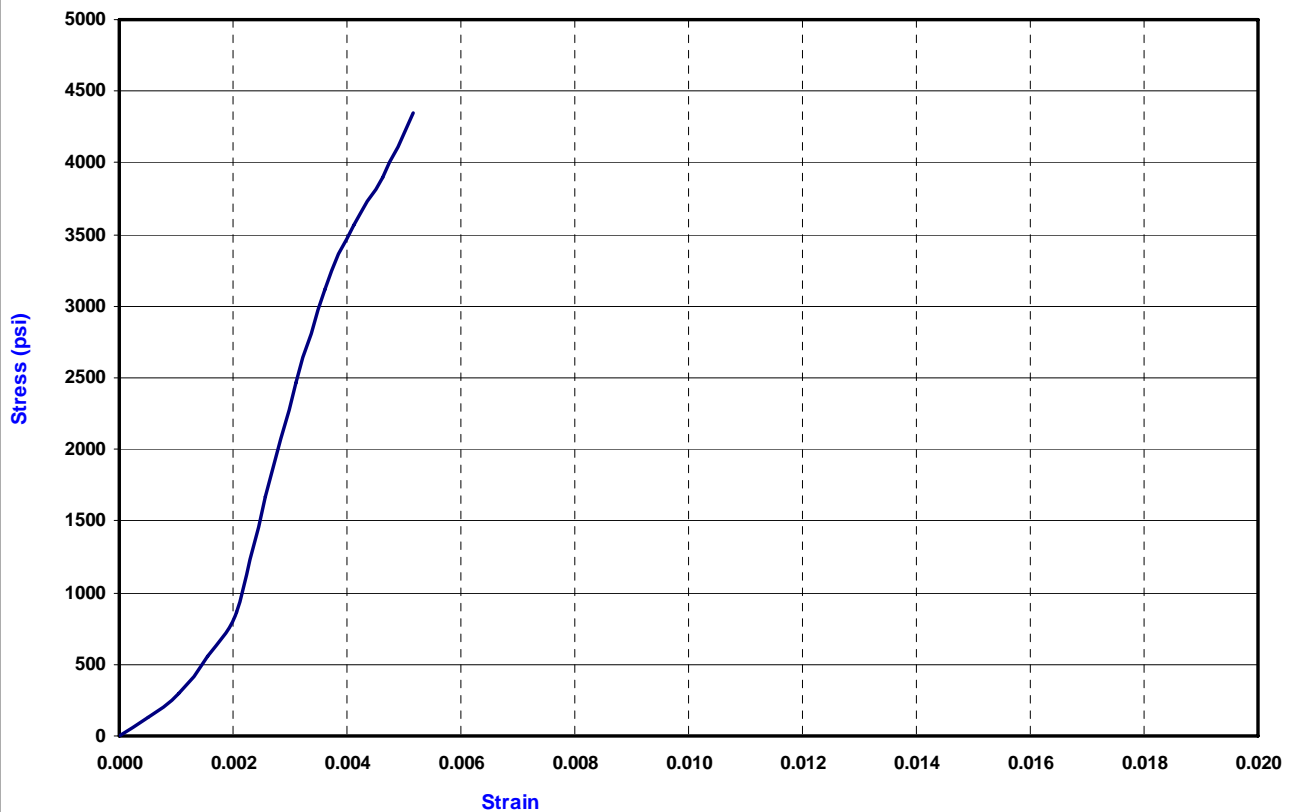
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-4, R-3 @ 29.8
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.879	1.981	167.7	1.96	NT	13400	4348	2.0

*NT: Not Tested

REMARKS:

Failure along Schistosity plane.



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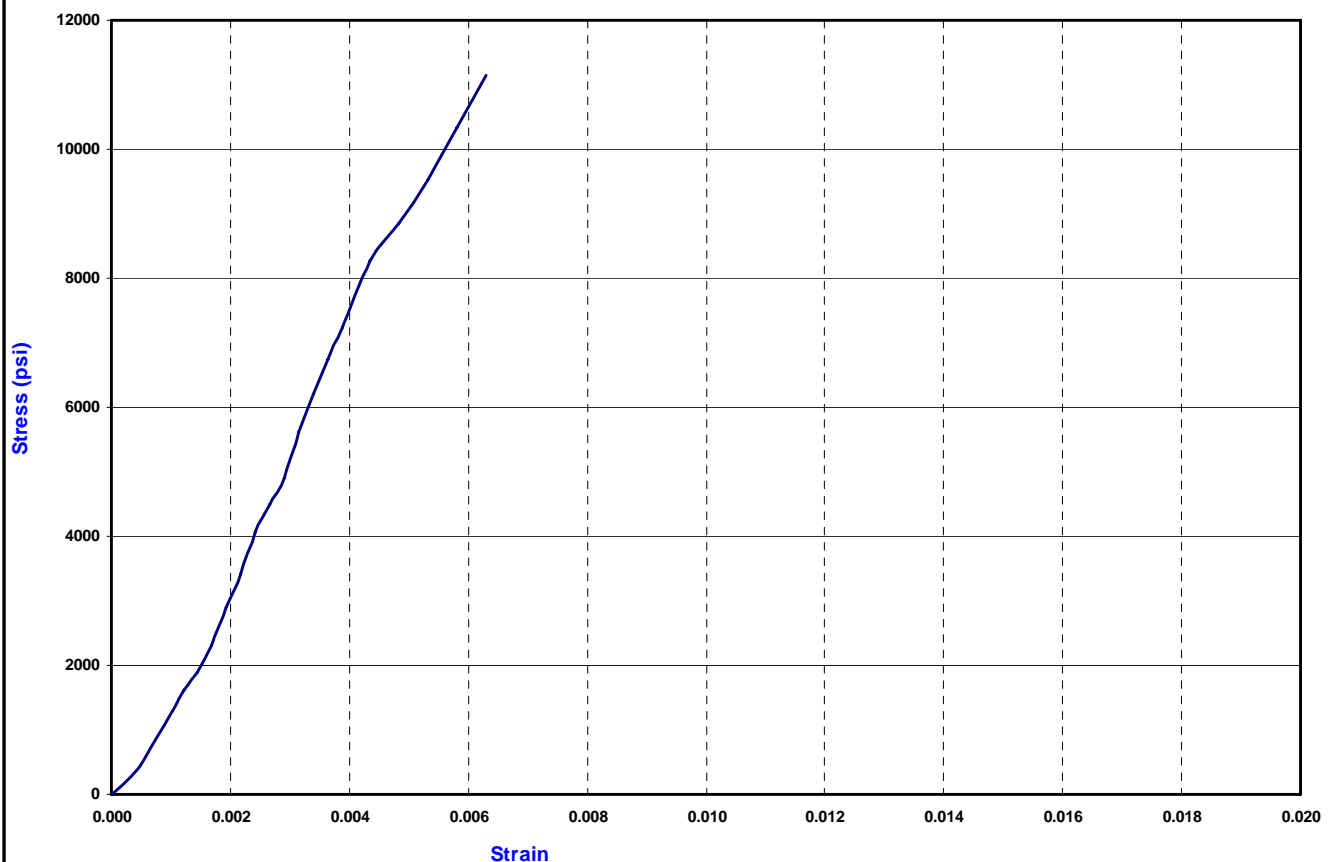
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-4, R-6 @ 46.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
4.130	1.985	175.7	2.08	NT	34500	11143	3.8

*NT: Not Tested

REMARKS:



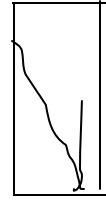
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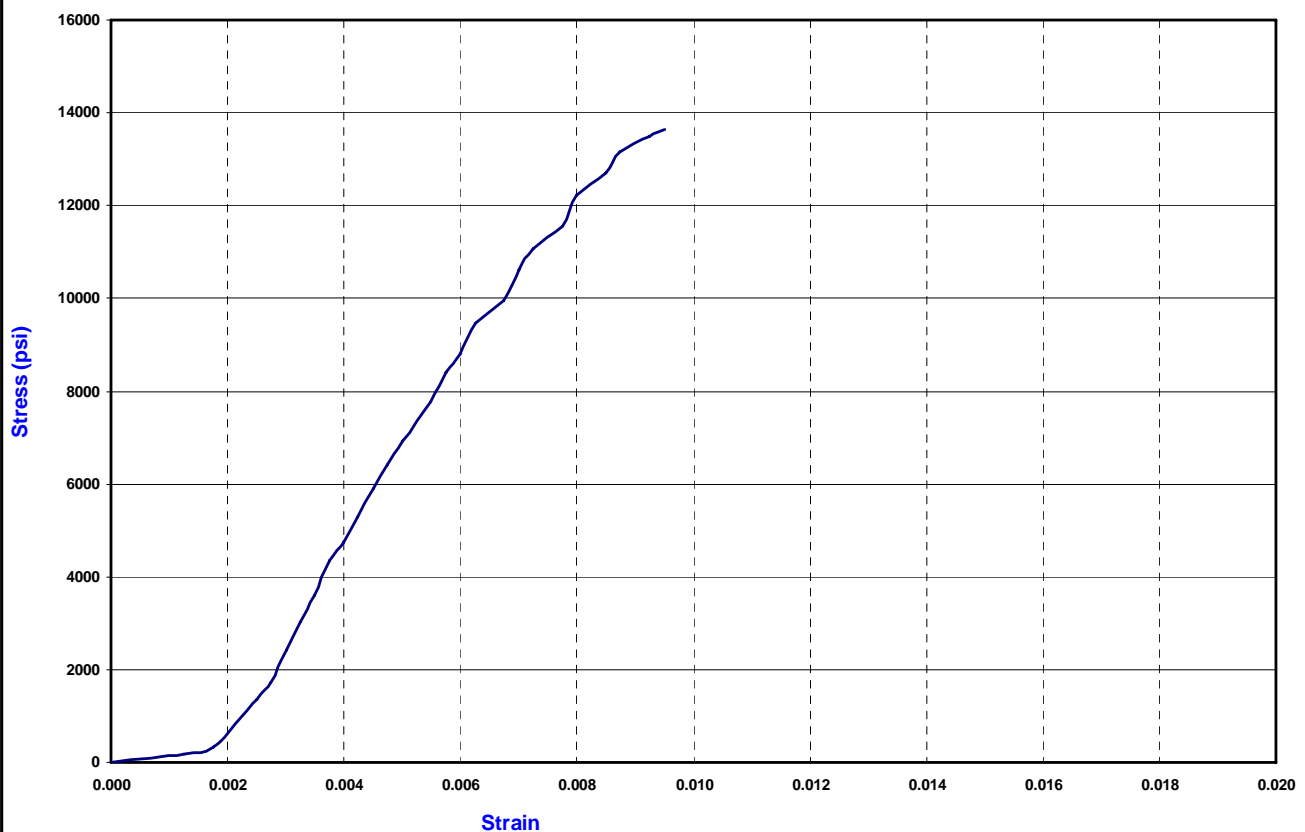
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAY-4, R-14 @ 85.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
4.002	1.991	174.8	2.01	NT	42500	13653	5.5

*NT: Not Tested

REMARKS:



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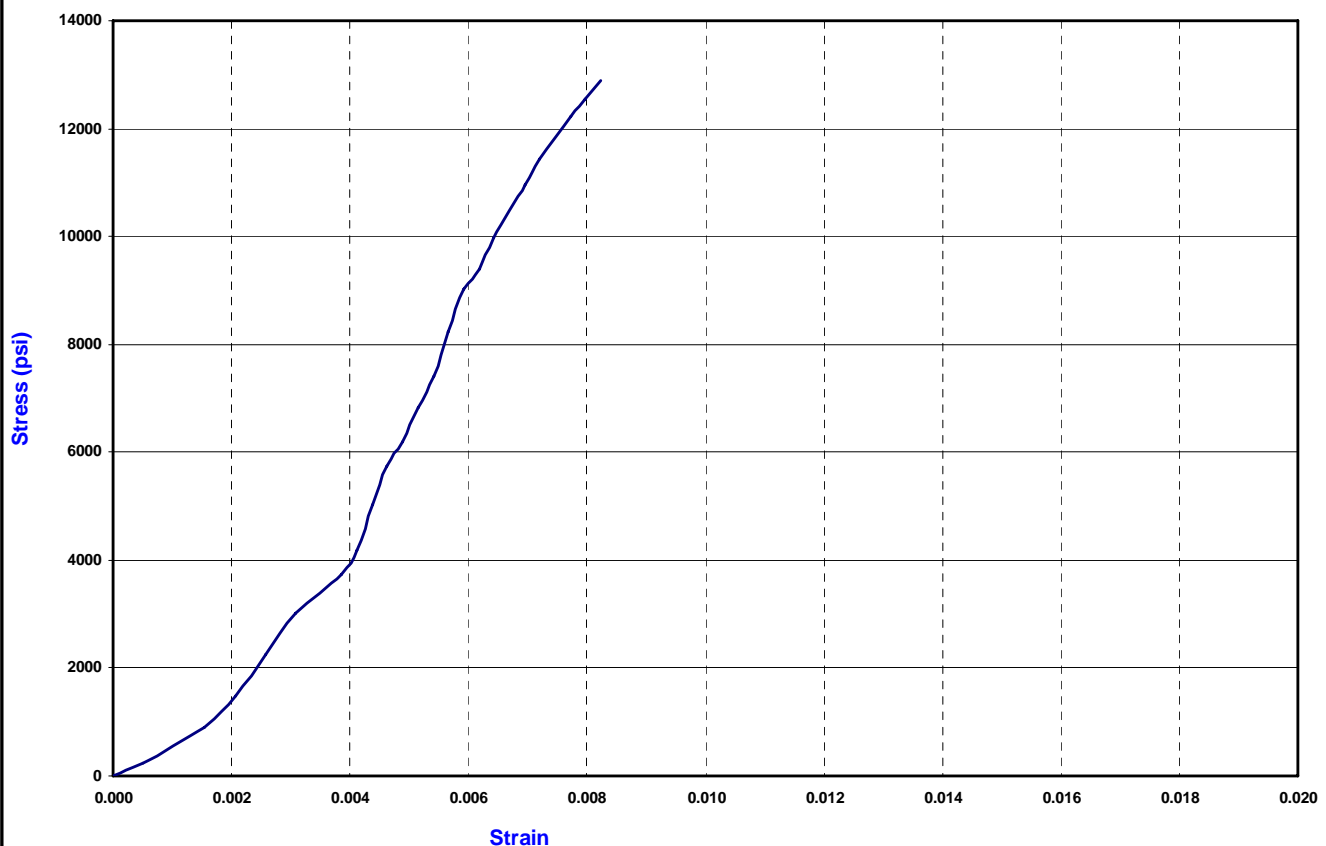
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-5, R-2 @ 18.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.886	1.989	173.2	1.95	NT	40000	12786	3.75

*NT: Not Tested

REMARKS:

Failure along Schistosity plane.



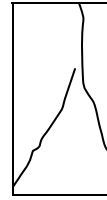
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UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORES

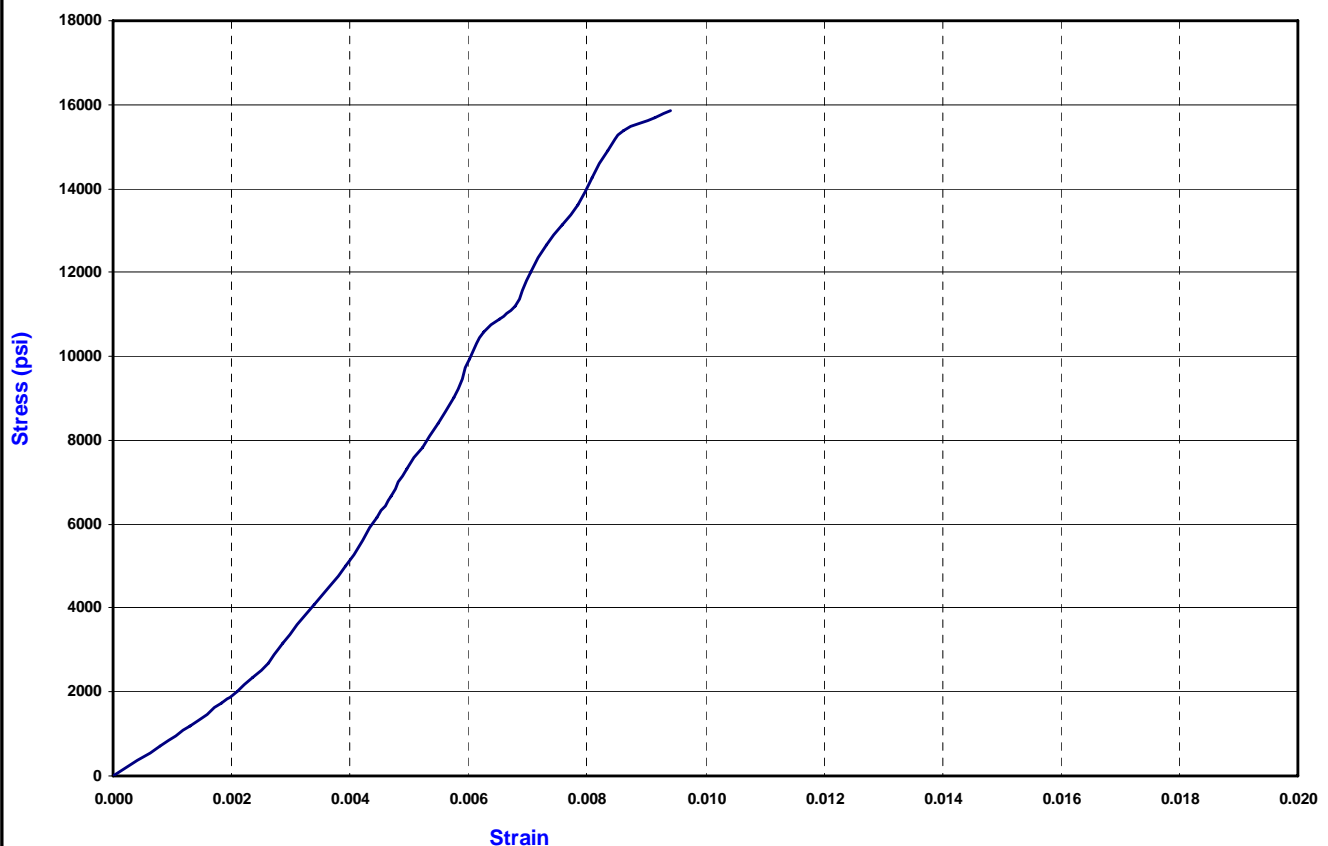
Reference: ASTM D2938

PROJECT: Purple Line
PROJECT No.: 14961-0
CORE IDENTIFICATION: WAYNE-5, R-9 @ 51.0'
DATE TESTED: 7/12/07
Sample Preparation: Sample was cut and capped. No moisture or temperature conditioning applied.
Failure Condition: Along Pre-existing Weakness? No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>

Sketch of Failure:



Unconfined Compressive Strength of Rock Cores



Avg. length (in)	Avg. Diameter (in)	Unit Weight (pcf)	L/D Ratio	Moisture Content (%)	Failure Load (lbs)	Max. UCS (psi)	Time to Failure (min)
3.828	1.994	172.0	1.92	NT	49500	15854	5.0

*NT: Not Tested

REMARKS:



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Appendix P

College Park Boring Logs

BORING LOG

BORING NUMBER: CP-1

SHEET NUMBER: 1 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DRILLING METHOD: **Mud Rotary Wash using Revert**

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: West end of Union Drive

COORD. N: 480,924.0 E: 1,326,627.0






STN. NO.: OFFSET:

SURFACE ELEV.: 158.3 feet

DATUM: Not surveyed/Approx. locations

START DATE: 6/14/07 TIME: 10:45 am

FINISH DATE: 6/15/07 TIME: 1:30 pm

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
	4"	1.375"									
	4.5"	2"									
	5.0'	24"									
Hammer Wt.	300lbs	140lbs	Drill Rod Size								
Hammer Fall	30"	30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
											Depth Elev.		
		*											0-1.0': Asphalt pavement and subbase
			S	1		1.0 - 3.0	7	5	7	5	7	157.8	Dry, stiff, brown, SILT, little fine Sand, trace medium, angular Gravel (ML) Pocket penetrometer > 4.5tsf; sample too stiff to set pocket torvane
			S	2		3.0 - 5.0	6	6	8	10	14		Same as S-1 (ML) Pocket penetrometer > 4.5tsf; sample too stiff to set pocket torvane Casing advanced after sampling to provide seal while using mud rotary wash.
5			S	3		5.0 - 7.0	4	6	7	7	16		*Blows not recorded since casing driven through disturbed material. Same as S-1, damp, dark brown (ML) Pocket penetrometer: 3.25 tsf
			S	4		7.0 - 9.0	6	11	22	23	17	151.3	Damp, dense, brown, fine to medium SAND, some clayey Silt, little fine to medium Gravel (SC-SM)
			S	5		9.0 - 11.0	11	18	26	35	18		Same as S-4 with pockets of dark brown Silt (SC-SM)
10			S	6		11.0 - 13.0	64	51	65	62	18	147.3	Damp, very dense, brown, fine to medium SAND and Silt with pockets of gray clayey Sand (SM)
			S	7		13.0 - 15.0	54	41	35	23	22		Damp, very dense, brown, fine to coarse SAND, some Silt with pockets of dark brown clayey Sand (SM)



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Quade &
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BORING LOG

(continued)

BORING NUMBER: **CP-1**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
			S	8		15.0 - 17.0	11	11	12	21	10	S-8A (top 9"): Same as S-7 (SM)	
			S	9		17.0 - 19.0	6	10	11	17	14	S-8B (bottom 1"): Damp, very stiff, red, CLAY & SILT (CL)	
			S	10		19.0 - 21.0	4	4	5	6	14	S-9A (top 5"): Same as S-8B (CL)	
			S	11		21.0 - 23.0	3	3	4	6	16	S-9B (bottom 9"): Damp, medium dense, mottled gray and brown, fine to medium SAND, some clayey Silt (SM)	
			S	12		23.0 - 25.0	3	4	4	5	16	S-12A (top 5"): Moist, stiff, mottled red and gray, Silty CLAY (CH)	
			S	13		25.0 - 27.0	2	2	3	3	18	S-12B (bottom 11"): Moist, medium dense, gray, fine to medium SAND, some clayey Silt (SM)	
			S	14		27.0 - 29.0	2	2	2	2	16	Moist, loose, mottled gray and brown, fine to medium SAND, some clayey Silt (SM)	
			S	15		29.0 - 31.0	woh	2	5	8	14	Same as S-13, brown (SM)	
			S	16		31.0 - 33.0	2	3	5	6	18	Same as S-13, medium dense (SM)	
			S	17		33.0 - 35.0	1/12"		3	3	16	Moist, medium dense, brown, fine to coarse SAND, some Silt with pockets of gray clayey Silt (SM)	
			S	18		35.0 - 37.0	1	2	2	3	12	Moist, loose, finely mottled brown and gray, fine to medium SAND, some clayey Silt (SM)	
												Same as S-17, gray (SM)	



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Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **CP-1**

SHEET NUMBER: 3 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.
40			S	19		37.0 - 39.0	2	1	2	3	24	Same as S-17, gray (SM)
			S	20		39.0 - 41.0	2	2	3	5	20	Same as S-17, light gray (SM)
			S	21		41.0 - 43.0	2	3	5	7	19	Same as S-17, medium dense (SM)
			S	22		43.0 - 45.0	2	2	3	5	17	Same as S-17, medium dense (SM)
			S	23		45.0 - 47.0	3	3	5	8	20	Same as S-17, medium dense with lenticular deposits less than 1" thick of gray silty Clay (SM)
			S	24		47.0 - 49.0	2	2	4	6	17	Same as S-17, medium dense, gray (SM)
			S	25		49.0 - 51.0	1	1	2	5	20	49 109.3 Same as S-17, medium dense, gray (SM)
			S	26		51.0 - 53.0	2	3	4	6	22	Same as S-17, medium dense, brown (SM)
			S	27		53.0 - 55.0	2	2	6	7	16	Same as S-17, medium dense (SM)
		55		S		28	55.0 - 57.0	1	1	4	5	8



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Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **CP-1**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
			S	29	57.0 - 59.0	5	7	9	14	12	Depth Elev.	Moist, hard, mottled red and brown, Silty CLAY, little fine to medium Sand, trace angular fine Gravel (CL)	
60												Bottom of boring at 59.0'. Boring tremie grouted with cement grout upon completion. Surface restored with concrete.	
65													
70													
75													

BORING LOG

BORING NUMBER: **CP-2**

SHEET NUMBER: 1 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DRILLING METHOD: HSA/Mud Rotary Wash using Revert

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: Front of Cole Student Activities Building

COORD. N: 480,972.0 E: 1,327,345.0






STN. NO.: OFFSET:

SURFACE ELEV.: 175.3 feet

DATUM: Not surveyed/Approx. locations

START DATE: 6/20/07 TIME: 8:00 am

FINISH DATE: 6/22/07 TIME: 2:00 pm

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
		1.375"	2.87"								
		2"	3"				6/20/07	11:00 am	24.0	24.0	24.0
		24"	24"				6/21/07	8:00 am	38.4	58.0	58.0
			140lbs	Drill Rod Size			6/27/07	11:15 am	33.0	0.0	80.0
		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
												0 - 1" Topsoil Hole advanced using hollow stem augers without drilling fluid to 60.0'.	
5			S	1		4.0 - 6.0	11	15	16	30	10	Damp, dense, brown, fine to coarse SAND, some silty Clay, trace coarse subangular Gravel (SC)	
10			S	2		9.0 - 11.0	9	12	14	16	14	Damp, very stiff, reddish brown, Silty CLAY (CH) Pocket penetrometer: 4.0 tsf; pocket torvane: 8.5 tsf	
			S	3		14.0 - 16.0	6	9	9	12	4	Damp, medium dense, brown, fine to coarse SAND, little fine to coarse subangular Gravel, little Clay with 1" pocket	

PURPLE LINE BORING LOG PURPLE LINE COLLEGE PARK DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/6/08



Parsons
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Quade &
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BORING LOG

(continued)

BORING NUMBER: **CP-2**

SHEET NUMBER: **2** of **6**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Parsons
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BORING LOG

(continued)

BORING NUMBER: **CP-2**

SHEET NUMBER: **3** of **6**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**






















LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
40			S	13		36.0 - 38.0	15	18	21	31	20	36 S-13A (top 12"): Damp, hard, mottled gray and brown, Silty CLAY frequently varved with fine to coarse SAND (CH)	
												139.3 S-13B (bottom 8") Damp, dense, brown, fine to coarse SAND, some silty Clay (SC)	
			S	14		38.0 - 40.0	15	21	17	24	20	138.3 Moist, hard, white, SILT, some fine to coarse Sand (ML)	
													
			S	15		40.0 - 42.0	10	16	26	78	24	Same as S-14 (ML) Water introduced into boring at 42.0' in order to prevent heaving in bottom of boring.	
													
			S	16		42.0 - 44.0	19	24	31	29	18	Same as S-14, mottled white and brown (ML)	
													
			S	17		44.0 - 46.0	10	12	16	24	18	S-17A (top 12"): Same as S-14, mottled white and brown (ML)	
													
45			S	18		46.0 - 48.0	14	20	25	29	17	45 S-17B (bottom 6"): Damp, very stiff, mottled gray and red, Silty CLAY (CH) Pocket penetrometer: 4.0 tsf; pocket torvane: 7.5 tsf Same as S-17B, hard, grayish brown (CH) Pocket penetrometer: 4.25 tsf; pocket torvane: 7.5 tsf	
													
			S	19		48.0 - 50.0	12	21	33	41	21	Same as S-17B, hard, trace fine Sand (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 9.0-10.5 tsf	
													
50			S	20		50.0 - 52.0	15	22	32	35	18	Same as S-17B, hard, grayish brown (CH) Pocket penetrometer: 4.5 tsf; pocket torvane: 7.5-12.5 tsf	
													
			S	21		52.0 - 54.0	16	27	32	34	24	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 6.75 tsf	
55													
			S	22		54.0 - 56.0	11	23	31	40	24	Same as S-17B, hard (CH)	
													
			S	23		56.0 - 58.0	16	36	48	63	23	Same as S-17B, hard, trace fine Sand (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 8.0 tsf	



Parsons
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BORING LOG

(continued)

BORING NUMBER: **CP-2**

SHEET NUMBER: **4** of **6**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**









LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
60			S	24		58.0 - 60.0	14	18	25	38	17	Same as S-17B, hard (CH) Pocket penetrometer: 4.5 tsf; pocket torvane: 10.5-17.5 tsf
			S	25		60.0 - 62.0	15	33	36	54	18	60.0': Switch to mud rotary wash drilling using drag bit and revert. Augers remain in hole as casing to 60.0'. Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 15.0-19.0 tsf
			S	26		62.0 - 64.0	18	32	48	58	16	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf; pocket torvane > 21.5 tsf
65			S	27		64.0 - 66.0	9	30	40	58	24	Same as S-17B, hard (CH)
			S	28		66.0 - 68.0	20	43	50	70	20	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 8.0 tsf
			S	29		68.0 - 70.0	17	34	52	63	24	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf
70			S	30		70.0 - 72.0	18	25	62	67	24	Same as S-17B, hard, gray (CH) Pocket penetrometer > 4.5 tsf
			S	31		72.0 - 74.0	20	38	48	72	18	Same as S-17B, hard (CH) Pocket penetrometer: 4.25 tsf
			S	32		74.0 - 76.0	18	31	44	54	24	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf
75			S	33		76.0 - 78.0	18	33	50	59	20	Same as S-17B, hard, gray (CH) Pocket penetrometer > 4.5 tsf



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BORING LOG

(continued)

BORING NUMBER: **CP-2**

SHEET NUMBER: **5** of **6**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
80			S	34	78.0 - 80.0	12	18	24	33	21	Same as S-17B, hard, gray (CH)	
			S	35		80.0 - 82.0	16	32	44	53	20	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf
			S	36		82.0 - 82.9	56	100/5"			7	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf
85			S	37	84.0 - 85.9	29	60	88	100/5"	15	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf	
			S	38	86.0 - 88.0	27	48	62	81	14	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf	
			S	39	88.0 - 90.0	24	42	52	66	24	Same as S-17B, hard (CH) Pocket penetrometer > 4.5 tsf	
90			S	40	90.0 - 92.0	20	37	47	62	20	Same as S-17B, hard, gray (CH)	
			S	41	92.0 - 94.0	20	48	54	77	15	Same as S-17B, hard, gray (CH)	
			S	42	94.0 - 96.0	16	27	47	52	18	Same as S-17B, hard, gray (CH) Pocket penetrometer > 4.5 tsf	
95			S	43	96.0 - 98.0	23	44	69	47	9	Same as S-17B, hard, gray (CH) Pocket penetrometer > 4.5 tsf	
			S	44	98.0 - 100.0	69	36	50	67	20	Same as S-17B, hard, gray (CH) Pocket penetrometer > 4.5 tsf	

BORING LOG

(continued)

BORING NUMBER: **CP-2**

SHEET NUMBER: 6 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]



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BORING LOG

BORING NUMBER: **CP-2A**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **College Park, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **Front of Cole Student
Activities Building**
COORD. N: **480,966.0** E: **1,327,349.0**
STN. NO.: OFFSET:
SURFACE ELEV.: **175.1 feet**
DATUM: **Not surveyed/Approx. locations**
START DATE: **6/22/07** TIME: **2:00 pm**
FINISH DATE: **6/26/07** TIME: **4:00 pm**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Mud Rotary Wash using Revert**
RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.	4"	S ■	U □	P □	G □	C □	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.	4.5"			3"			6/27/07	9:05 am	3.0	0.0	79.0
Length	5.0'			36"							
Hammer Wt.	300lbs		Drill Rod Size								
Hammer Fall	30"		I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %			
5		*												Casing set to 10.0'. Casing driven to provide seal while using mud rotary wash. Casing driven after advancing hole with hollow stem auger. *Blows not recorded since casing driven through open hole. Advanced hole without sampling using mud rotary wash drilling and revert to 24.0'.
10														

BORING LOG

(continued)

BORING NUMBER: CP-2A

SHEET NUMBER: 2 of 5

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
20			P	1	23.0 - 26.0						21	Moist, soft to medium stiff, mottled red, brown, and gray, CLAY (CH)	
25													
30													
35			P	2	33.0 - 36.0						10	Moist, medium stiff, mottled gray, red, and brown, CLAY with visible fissures (CL)	

BORING LOG

(continued)

BORING NUMBER: CP-2A

SHEET NUMBER: 4 of 5

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
60													
65													
70													
75													
			P	4		76.0 - 79.0						24	Moist, soft to medium stiff, dark reddish brown, CLAY (CL)



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BORING LOG

(continued)

BORING NUMBER: **CP-2A**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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BORING LOG

BORING NUMBER: CP-2B

SHEET NUMBER: 1 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**

DRILLING METHOD: HSA/Mud Rotary Wash using Revert

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: Front of Cole Student Activities Building

COORD. N: 480,967.0 E: 1,327,342.0






STN. NO.: OFFSET:

SURFACE ELEV.: 175.0 feet

DATUM: Not surveyed/Approx. locations

START DATE: 7/19/07 TIME: 9:50 am

FINISH DATE: 7/24/07 TIME: 11:00 am

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
	4"	1.375"									
	4.5"	2"									
	5.0'	24"									
	300lbs	140lbs	Drill Rod Size								
	30"	30"	I.D. (O.D.)								

[illegible]

BORING LOG

(continued)

BORING NUMBER: CP-2B

SHEET NUMBER: 3 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]



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BORING LOG

(continued)

BORING NUMBER: **CP-2B**

SHEET NUMBER: 4 of 6

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %			
														Depth Elev.
60														58.0-63.0': Approximately 175 gallons of water lost in mud rotary wash run. Increase in pressure of water flowing out of CP-2A monitoring well.
65														Drill rods disconnected from rig in order to release head from CP-2B and stop seepage into CP-2A monitoring well. CP-2A well backfilled with bentonite to prevent water loss while drilling. First attempt to advance mud rotary wash bit resulted in no advancement and water loss of approximately 250 gallons. During second attempt, mud rotary wash bit advanced to 68.0' and approximately 250 gallons of water lost. No cuttings returned.
70														68.0' to 73.0': Boring advanced using mud rotary wash. No cuttings returned.
75														Mud rotary wash rods and bit and casing pulled from hole. Advanced hollow stem augers down hole to serve as casing. Augered without sampling to 98.0'.

BORING LOG

(continued)

BORING NUMBER: CP-2B

SHEET NUMBER: 5 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS			
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)				
							CORING								
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %			Depth Elev.	
80															
85															
90															
95															
			S	1		98.0 - 100.0	18	35	53	68					Began SPT at 98.0'. Drove sampler. Sampler connect rod broke leaving SPT sampler stuck in hole. Attempted to



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BORING LOG

(continued)

BORING NUMBER: **CP-2B**

SHEET NUMBER: **6** of **6**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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BORING LOG

BORING NUMBER: CP-2C

SHEET NUMBER: 1 of 8

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**

DRILLING METHOD: HSA/Mud Rotary Wash using Revert

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: Front of Cole Student Activities Building

COORD. N: 480,969.0 E: 1,327,338.0






STN. NO.: OFFSET:

SURFACE ELEV.: 175.1 feet

DATUM: Not surveyed/Approx. locations

START DATE: 7/24/07 TIME: 11:15 am

FINISH DATE: 7/27/07 TIME: 3:00 pm

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
		1.375"									
		2"									
		24"									
		140lbs	Drill Rod Size								
		30"	I.D. (O.D.)								

[illegible]

BORING LOG

(continued)

BORING NUMBER: CP-2C

SHEET NUMBER: 3 of 8

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]

BORING LOG

(continued)

BORING NUMBER: CP-2C

SHEET NUMBER: 4 of 8

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]

BORING LOG

(continued)

BORING NUMBER: CP-2C

SHEET NUMBER: **5** of **8**

PROJECT NUMBER: 18005 A

PROJECT: Purple Line


LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
80													
95													



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BORING LOG

(continued)

BORING NUMBER: **CP-2C**

SHEET NUMBER: **6** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
100			S	2	100.0 - 102.0	18	35	46	64	22	Pocket penetrometer > 4.5 tsf Damp, hard, mottled red, light gray, and greenish gray, CLAY, trace fine to medium Sand (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf	
			S	3	102.0 - 103.9	31	59	75	100/5"	21	Same as S-2 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf	
105			S	4	104.0 - 106.0	20	34	38	64	22	S-4A (Top 8"): Same as S-2 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf S-4B (Bottom 14"): Damp, hard, gray, Silty CLAY, trace red ironite deposits (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf	
			S	5	106.0 - 107.9	33	51	85	100/5"	23	Damp, hard, mottled red, light gray, and greenish gray at top 3" and gray thereafter, CLAY, trace fine to medium Sand, trace lignite (CH) Pocket penetrometer > 4.5 tsf	
			S	6	108.0 - 109.9	29	45	80	100/5"	21	Damp, hard, mottled gray and red, Silty CLAY, trace fine Sand in bottom 7" (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf	
110			S	7	110.0 - 111.9	45	51	67	100/5"	21	Same as S-6, little fine Sand (CH) Pocket penetrometer > 4.5 tsf	
			S	8	112.0 - 114.0	25	40	57	84	24	Same as S-6, little fine Sand (CH) Pocket penetrometer > 4.5 tsf	
			S	9	114.0 - 115.9	26	58	89	100/5"	23	S-9A (Top 6"): Same as S-6, little fine Sand (CH)	
115												114.5 60.6 Damp, very dense, mottled light brown and white, fine to medium SAND, some clayey Silt (SM)
			S	10	116.0 - 117.9	25	52	70	100/5"	20	116 59.1 S-10A (Top 10"): Damp, hard, mottled brown, red, and gray, Silty CLAY, trace fine Sand (CH)	
												116.83 58.27 S-10B (Bottom 10"): Damp, very dense, light gray, fine SAND, some clayey Silt (SM)
		S	11	118.0 - 119.9	31	52	85	100/5"	23	118.42 56.68 S-11A (Top 5"): Same as S-10B (SM) S-11B (Bottom 18"): Damp, hard, mottled brown, red, and gray, Silty CLAY, trace fine to medium Sand (CH) Pocket penetrometer > 4.5 tsf		



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BORING LOG

(continued)

BORING NUMBER: **CP-2C**

SHEET NUMBER: **7** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


















LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
125			S	12		120.0 - 121.9	39	59	91	100/5"	21	Same as S-11B (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane > 9.0 tsf	
			S	13		122.0 - 124.0	26	44	70	100/6"	19	Same as S-11B with 2" gray Clay seam at 123.25' (CH) Pocket penetrometer > 4.5 tsf; pocket torvane > 9.0 tsf	
			S	14		124.0 - 126.0	22	37	59	84	20	124.51.1 S-14A (Top 13"): Damp, very dense, light gray, fine SAND, some clayey Silt (SM); frequent slickensides present in sample 125.08 Pocket penetrometer > 4.5 tsf 50.02	
			S	15		126.0 - 127.9	29	50	75	100/5"	21	126.548.6 S-14B (Bottom 7"): Damp, hard, mottled red and gray, Silty CLAY, some fine to medium Sand (CH) Pocket penetrometer > 4.5 tsf; pocket torvane > 9.0 tsf S-15A (Top 6"): Same as S-14B (CH) S-15B (Bottom 15"): Damp, very dense, light gray, fine SAND, some clayey Silt (SM)	
				S	16		128.0 - 130.0	26	37	45	58	20	128.47.1 Damp, very dense, light gray, fine to medium SAND, some clay (SC)
130			S	17		130.0 - 132.0	14	26	37	51	24	Same as S-16 (SC)	
			S	18		132.0 - 133.8	21	29	60	100/3"	21	Same as S-16 with 0.25" to 0.5" seams of Clay (SC)	
			S	19		134.0 - 134.8	33	100/3.5"			9	Same as S-16 with 0.25" to 0.5" seams of Clay (SC)	
135			S	20		136.0 - 136.8	67	100/4"			6	136.39.1 Damp, very dense, gray, fine to medium SAND, some silt (SM)	
			S	21		138.0 - 138.8	89	100/3"			6	Same as S-20 with 0.75" pockets of lignite (SM)	
140												Bottom of boring at 140.0'.	

BORING LOG

(continued)

BORING NUMBER: CP-2C

SHEET NUMBER: 8 of 8

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]



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BORING LOG

BORING NUMBER: **CP-3**

SHEET NUMBER: **1** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **HSA/Mud Rotary Wash using Revert**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Front of Health Center**

COORD. N: **481,096.0** E: **1,328,213.0**






STN. NO.: OFFSET:

SURFACE ELEV.: **160.9 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **7/9/07** TIME: **7:15 am**

FINISH DATE: **7/13/07** TIME: **3:30 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"					7/9/07	12:00 pm	35.0	35.0	35.0
Length		24"					7/10/07	7:30 am	47.0	50.0	60.0
Hammer Wt.		140lbs	Drill Rod Size				7/11/07	7:30 am	15.0	50.0	80.0
Hammer Fall		30"	I.D. (O.D.)				7/12/07	9:30 am	10.0	50.0	100.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					7/13/07 8:30 am 5.0 50.0 120.0	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	FIELD CLASSIFICATION AND REMARKS	
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		Depth Elev.
												0 - 2" Topsoil Hole advanced using hollow stem augers without drilling fluid to 52.0'.	
5			S	1		3.0 - 5.0	12	27	23	24	2	Dry, very dense, brown, fine SAND, some Silt, some red, fine to coarse subangular Gravel (may have blocked spoon) (SM)	



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BORING LOG

(continued)

BORING NUMBER: **CP-3**

SHEET NUMBER: **2** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
												Depth Elev.
20			S	4		18.0 - 20.0	3	4	7	11	16	Damp, stiff, mottled red and gray, CLAY, trace fine Sand (CH) Pocket penetrometer: 3.5 tsf; pocket torvane: 12.5 tsf
25			S	5		23.0 - 25.0	4	4	8	8	21	Same as S-4 (CH); slickensides present in sample Pocket penetrometer: 3.5 tsf; pocket torvane: 12.5-17.5 tsf
30			S	6		28.0 - 30.0	4	5	6	9	22	Same as S-4 (CH); slickensides present in sample Pocket penetrometer: 2.5 tsf; pocket torvane: 11.25 tsf
			S	7		30.0 - 32.0	4	6	9	12	24	Same as S-4, gray at bottom 12" (CH); slickensides present in sample Pocket penetrometer: 2.5 tsf
			S	8		32.0 - 34.0	6	7	10	11	24	S-8A (top 12"): Same as S-4, gray (CH)
			S	9		34.0 - 36.0	7	10	11	16	24	S-8B (bottom 12"): Moist, medium dense, gray, fine to medium SAND, some silty Clay (SC) Same as S-8B (SC)
35												35.0': Water encountered during drilling.



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BORING LOG

(continued)

BORING NUMBER: **CP-3**

SHEET NUMBER: **3** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
40			S	10		36.0 - 38.0	4	8	10	15	14	S-10A (top 9"): Same as S-8B (SC)	
											36.75 S-10B (bottom 5"): Damp, very stiff, gray, Silty CLAY, little fine Sand (CH)		
			S	11		38.0 - 39.8	16	27	75	100/4"	22	S-11A (top 14"): Same as S-10B, hard, trace lignite (CH)	
											39.16 S-11B (bottom 8"): Moist, very dense, gray, fine to medium SAND, some silty Clay (SC)		
45			S	12		40.0 - 42.0	23	54	67	49	14	Same as S-11B (SC)	
											42 S-13 (top 14"): Damp, hard, brown, CLAY & SILT (CL)		
			S	13		42.0 - 44.0	15	24	33	35	22	Pocket penetrometer > 4.5 tsf; pocket torvane: 4.0-5.0 tsf	
50			S	14		44.0 - 46.0	10	17	27	35	21	Same as S-13, little fine to medium Sand (CL)	
											Pocket penetrometer > 4.5 tsf; pocket torvane: 10.0 tsf		
			S	15		46.0 - 48.0	15	18	30	30	18	Same as S-13, faintly mottled brown, gray, and red (CL)	
											Pocket penetrometer: 4.5 tsf; pocket torvane: 10.0 tsf		
55			S	16		48.0 - 50.0	15	20	28	37	18	Same as S-13 (CL); slickensides present in sample	
											Pocket penetrometer: 3.25 tsf; pocket torvane: 7.5 tsf		
			S	17		50.0 - 52.0	16	23	34	42	18	Same as S-13, gray (CL)	
											Pocket penetrometer: 1.75 tsf; pocket torvane: 4.4 tsf		
			S	18		52.0 - 54.0	15	24	40	41	22	52.0': Switch to mud rotary wash drilling using drag bit and revert. Augers remain in hole as casing to 52.0'.	
											Same as S-13, gray (CL)		
											Pocket penetrometer: 2.75 tsf; pocket torvane: 8.75-11.25 tsf		
			S	19		54.0 - 56.0	12	37	46	51	22	Same as S-13, gray (CL)	
												Pocket penetrometer: 3.25 tsf; pocket torvane: 5.0 tsf	
			S	20		56.0 - 58.0	17	26	40	44	22	Same as S-13, gray (CL)	
												Pocket penetrometer: 3.25 tsf; pocket torvane: 10.7 tsf	



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BORING LOG

(continued)

BORING NUMBER: **CP-3**

SHEET NUMBER: **4** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**





LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
60			S	21		58.0 - 60.0	16	17	21	29	24	Same as S-13, gray, occasionally varved with 1" layers of gray fine clayey SAND (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 8.75 tsf
			S	22		60.0 - 62.0	16	19	27	32	24	60 100.9 Damp, hard, gray, CLAY (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 8.75 tsf
			S	23		62.0 - 64.0	12	15	20	26	22	Damp, hard, gray, Silty CLAY, trace fine rounded Gravel, trace medium to coarse Sand, trace lignite (CH); slickensides present in sample
65		S	24	64.0 - 66.0		9	14	22	27	24	Damp, hard, mottled gray and purple, CLAY (CH); slickensides present in sample Pocket penetrometer: 4.25 tsf; pocket torvane: 10.0 tsf	
		S	25	66.0 - 68.0		11	16	21	32	10	Same as S-24, trace fine Sand (CH) Pocket penetrometer: 4.5 tsf; pocket torvane: 12.5 tsf	
		S	26	68.0 - 70.0		14	23	27	35	12	68 92.9 Damp, hard, brown, CLAY & SILT, some fine Sand (CL)	
70			S	27		70.0 - 72.0	6	18	29	39	21	70 90.9 Damp, hard, gray, Silty CLAY, trace lignite (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 10.0 tsf
			S	28		72.0 - 74.0	9	14	20	31	18	Damp, hard, mottled gray and brown, Silty CLAY (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 15.0 tsf
			S	29		74.0 - 76.0	12	19	26	31	20	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 15.0 tsf
75			S	30		76.0 - 78.0	14	22	26	37	24	Same as S-28, trace fine Sand (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 13.75 tsf

PURPLE LINE BORING LOG - PURPLE LINE COLLEGE PARK DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/6/08



Parsons
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BORING LOG

(continued)

BORING NUMBER: **CP-3**

SHEET NUMBER: **5** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


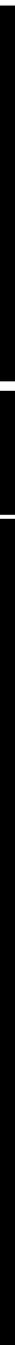
LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
80			S	31		78.0 - 80.0	18	25	37	51	24	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 15.0 tsf
			S	32		80.0 - 82.0	21	32	74	96	19	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5-17.5 tsf
			S	33		82.0 - 83.8	26	53	88	100/4"	22	Same as S-28 (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 7.5 tsf
85			S	34		84.0 - 85.9	33	46	6	100/5"	22	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5 tsf
			S	35		86.0 - 88.0	19	22	33	46	24	Same as S-28, trace lignite (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5 tsf
			S	36		88.0 - 90.0	19	27	48	57	24	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 13.75 tsf
90			S	37		90.0 - 92.0	20	37	44	57	24	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5 tsf
			S	38		92.0 - 94.0	22	37	58	88	24	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5 tsf
			S	39		94.0 - 96.0	29	44	74	97	22	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 16.25 tsf
95			S	40		96.0 - 98.0	20	36	58	75	20	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 18.75 tsf
			S	41		98.0 - 100.0	17	32	38	51	18	Same as S-28 (CH); slickensides present in sample Pocket penetrometer: 3.5 tsf; pocket torvane: 8.75 tsf



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BORING LOG

(continued)

BORING NUMBER: **CP-3**

SHEET NUMBER: **6** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**



LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
100			S	42	100.0 - 102.0	14	38	60	71	19	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 11.25 tsf	
			S	43	102.0 - 104.0	16	29	36	52	20	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 12.0-17.5 tsf	
			S	44	104.0 - 106.0	16	25	38	52	15	Same as S-28 (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 8.75-12.5 tsf	
105			S	45	106.0 - 108.0	25	45	74	100/6"	9	Same as S-28, gray (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf; pocket torvane: 8.75-12.5 tsf	
			S	46	108.0 - 109.9	31	56	72	100/5"	14	108 52.9 Damp, hard, mottled gray and purple, SILT & CLAY, little fine Sand (CL) Pocket penetrometer > 4.5 tsf	
110			S	47	110.0 - 111.0	50	100/6"			5	Same as S-46 (CL)	
			S	48	112.0 - 113.0	55	100/6"			7	Same as S-46 (CL) Pocket penetrometer > 4.5 tsf	
			S	49	114.0 - 115.9	49	75	98	100/5"	23	Same as S-46 (CL) Pocket penetrometer > 4.5 tsf	
115			S	50	116.0 - 117.4	40	85	100/5"		7	Same as S-46 (CL) Pocket penetrometer > 4.5 tsf	
			S	51	118.0 - 120.0	30	50	81	89	10	118 42.9 Damp, hard, brown, CLAY (CH) Pocket Penetrometer: 2.0 tsf	



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BORING LOG

(continued)

BORING NUMBER: **CP-3**

SHEET NUMBER: **7** of **8**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
			S	52		120.0 - 121.9	47	79	96	100/5"	18	Same as S-51, mottled brown, gray, and purple (CH) Pocket penetrometer > 4.5 tsf	
			S	53		122.0 - 123.4	47	100/5"			10	122.38.9 Moist, hard, gray, CLAY & SILT, some fine Sand (CL)	
			S	54		124.0 - 126.0	24	32	58	100/6"	20	S-54A (top 10"): Same as S-53, mottled gray and brown (CL) 124.83 S-54B (bottom 10"): Damp, hard, mottled brown and gray, Silty CLAY (CH) 36.07 Pocket penetrometer > 4.5 tsf	
125			S	55		126.0 - 127.9	32	55	79	100/5"	20	Same as S-54B, trace fine Sand (CH); slickensides present in sample Pocket penetrometer > 4.5 tsf	
			S	56		128.0 - 129.5	36	67	100/6"		18	Same as S-54B, trace fine Sand in top 10" (CH) Pocket penetrometer > 4.5 tsf	
130			S	57		130.0 - 131.5	34	65	100/6"		14	Same as S-54B (CH) Pocket penetrometer > 4.5 tsf	
			S	58		132.0 - 134.0	17	30	38	64	24	Same as S-54B, some fine Sand (CH) Pocket penetrometer > 4.5 tsf	
			S	59		134.0 - 135.3	26	39	100/4"		16	Same as S-54B (CH)	
135			S	60		136.0 - 136.8	100/4"				2	Same as S-54B (CH)	
			S	61		138.0 - 139.3	61	92	100/4"		9	138.22.9 Moist, very dense, gray, fine SAND, some silty Clay (SC)	
140												Bottom of boring at 140.0'. Offset boring drilled to obtain pitcher samples. See boring log for CP-3A.	



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BORING LOG

BORING NUMBER: **CP-3A**

SHEET NUMBER: **1** of **6**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Sedillo**

DRILLING METHOD: **Mud Rotary Wash using Revert**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Front of Health Center**

COORD. N: **481,088.0** E: **1,328,214.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **161.3 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **7/16/07** TIME: **2:45 pm**

FINISH DATE: **7/18/07** TIME: **3:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.	4"			2.87"			Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.	4.5"			3"							
Length	5.0'			36"							
Hammer Wt.	300lbs		Drill Rod Size								
Hammer Fall	30"		I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5		*											Casing set to 9.5'. Casing driven to provide seal while using mud rotary wash. Casing driven after advancing hole with hollow stem auger. *Blows not recorded since casing driven through open hole.
10													



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BORING LOG

(continued)

BORING NUMBER: **CP-3A**

SHEET NUMBER: 2 of 6

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **R. Sedillo**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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PURPLE LINE BORING LOG - PURPLE LINE COLLEGE PARK DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/6/08

BORING LOG

(continued)

BORING NUMBER: CP-3A

SHEET NUMBER: 3 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]

BORING LOG

(continued)

BORING NUMBER: CP-3A

SHEET NUMBER: 5 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]

BORING LOG

(continued)

BORING NUMBER: CP-3A

SHEET NUMBER: 6 of 6

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: **R. Sedillo**[illegible]



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BORING LOG

BORING NUMBER: **CP-4**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **HSA/Mud Rotary Wash using Revert**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Median on Regents Drive at
Campus Drive**

COORD. N: **480,951.0** E: **1,329,343.0**






STN. NO.: OFFSET:

SURFACE ELEV.: **97.1 feet**

DATUM: **Not surveyed/Approx. locations**

START DATE: **6/28/07** TIME: **7:30 am**

FINISH DATE: **7/2/07** TIME: **1:30 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"					6/28/07	12:00 pm	27.0	27.0	27.0
Length		24"					6/29/07	8:30 am	41.0	50.0	50.0
Hammer Wt.		140lbs	Drill Rod Size				7/2/07	7:45 am	26.0	50.0	65.0
Hammer Fall		30"	I.D. (O.D.)				7/2/07	1:00 pm	27.0	39.0	39.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
												Depth Elev.	
												0' ~ 2" Topsoil 97.16 Hole advanced using hollow stem augers without drilling fluid to 56.0'. 96.94	
5			S	1		3.0 - 5.0	21	17	17	14	16	Dry, hard, brown, Silty CLAY, some fine Sand, trace subrounded fine Gravel (CL)	
			S	2		8.0 - 10.0	14	17	10	10	6	Same as S-1, very stiff (CL)	
10			S	3		10.0 - 12.0	14	17	18	23	18	10 87.1 Damp, hard, mottled red, orange, and brown, Silty CLAY, some fine to medium Sand (CH) Pocket penetrometer: 3.75 tsf; pocket torvane: 10.0 tsf	
			S	4		12.0 - 14.0	9	12	16	17	20	Same as S-3, very stiff, trace medium rounded Gravel (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 10.0 tsf	
			S	5		14.0 - 16.0	4	7	11	15	17	Same as S-3, very stiff (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 7.5-10.0 tsf	



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BORING LOG

(continued)

BORING NUMBER: **CP-4**

SHEET NUMBER: **2** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**





LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
											Depth Elev.	
20			S	6	16.0 - 18.0	4	6	7	15	15	Same as S-3, very stiff (CH) Pocket penetrometer: 3.75-4.25 tsf; pocket torvane: 10.0 tsf	
			S	7	18.0 - 20.0	6	9	15	18	19	Damp, very stiff, mottled brown and gray, Silty CLAY, trace fine to coarse Sand (CH) Pocket penetrometer > 4.5 tsf; pocket torvane: 13.75 tsf	
			S	8	20.0 - 22.0	14	17	19	25	12	20 77.1	Damp to moist, dense, mottled reddish brown and light gray, fine to coarse SAND, some subrounded fine to coarse quartz Gravel, little clayey Silt, trace Mica (SM)
			S	9	22.0 - 24.0	42	77	77	68	16	Damp, very dense, light brown and light gray, fine to coarse SAND, some fine to medium subangular and broken Gravel, trace clayey Silt (SM)	
25			S	10	24.0 - 26.0	24	32	53	50	14	Same as S-9 (SM)	
			S	11	26.0 - 28.0	33	50	42	33	3	26 71.1	No recovery on first attempt. Split spoon alternately pushed and driven in second attempt to collect sample. Blows indicated are from first attempt. Recovery indicated is from second attempt.
30			S	12	28.0 - 30.0	37	29	10	11	5	28 69.1	Wet, very dense, light brown, fine to medium subrounded GRAVEL, little fine to coarse Sand (GP) Water encountered during drilling at 27.0 ft. Wet, dense, brown, fine to coarse SAND, trace Clay (SC) Low blow counts begun at 28.75'.
			S	13	30.0 - 32.0	4	6	11	11	4	Wet, medium dense, light brown, fine to coarse SAND, little fine to medium Gravel, trace Clay (SC)	
			S	14	32.0 - 34.0	6	6	11	12	24	32 65.1	Moist to wet, medium dense, light brown to white, fine to medium SAND, trace fine to medium Gravel, trace clayey Silt (SP-SM)
			S	15	34.0 - 36.0	10	16	23	29	14	Wet, dense, light brown to white, fine to coarse SAND, little fine to medium Gravel, trace Silt (SP-SM)	
35												



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BORING LOG

(continued)

BORING NUMBER: **CP-4**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
40			S	16		36.0 - 38.0	4	9	11	11	1	Wet, medium dense, light brown to white, fine to coarse SAND, trace fine Gravel, trace Silt (SP-SM)
			S	17		38.0 - 40.0	6	9	12	15	24	38 59.1 S-17A (Top 18") Moist, medium dense, gray with brown layers, fine SAND, some Silt (SM)
			S	18		40.0 - 42.0	7	11	15	20	20	39.5 57.6 S-17B (Bottom 6") Damp, very stiff, red and brown, CLAY & SILT (CL) Pocket penetrometer: 2.5 tsf; pocket torvane: 7.5 tsf Same as S-17B, trace fine Sand (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 3.5 tsf
			S	19		42.0 - 44.0	11	17	23	33	14	Same as S-17B, hard, trace fine Sand (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 11.25 tsf
			S	20		44.0 - 46.0	8	18	26	32	18	Same as S-17B, hard (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 16.25 tsf
			S	21		46.0 - 48.0	14	26	38	44	17	Same as S-17B, hard (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 16.25 tsf
			S	22		48.0 - 50.0	28	37	66	88	22	Same as S-17B, hard (CL) Pocket penetrometer: 3.5 tsf; pocket torvane: 13.75-17.5 tsf
			S	23		50.0 - 52.0	12	19	26	31	14	Same as S-17B, hard (CL) Pocket penetrometer: 4.5 tsf; pocket torvane: 16.25-17.5 tsf
			S	24		52.0 - 54.0	17	23	30	34	8	Same as S-17B, hard, trace fine Sand (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 11.25-16.25 tsf
			S	25		54.0 - 56.0	16	20	27	30	21	Same as S-17B, hard, trace fine Sand (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 13.75 tsf
		55		S	26		56.0 - 58.0	9	18	25	35	12



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BORING LOG

(continued)

BORING NUMBER: **CP-4**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


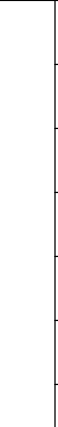
LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
60												56.0'. Same as S-17B, hard, trace fine Sand (CL) Pocket penetrometer: 3.75 tsf; pocket torvane: 12.5 tsf Same as S-17B, hard, trace fine Sand (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 11.25 tsf
		S	27	58.0 - 60.0	16	31	42	67	22			
		S	28	60.0 - 62.0	15	24	30	39	22	Same as S-17B, hard (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 11.25 tsf		
		S	29	62.0 - 64.0	26	39	50	75	22	Same as S-17B, hard (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5 tsf		
		S	30	64.0 - 66.0	17	35	55	74	20	Same as S-17B, hard (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 11.25 tsf		
		S	31	66.0 - 67.9	25	40	93	100/5"	14	Same as S-17B, hard (CL) Pocket penetrometer > 4.5 tsf; pocket torvane: 12.5 tsf		
		S	32	68.0 - 70.0	18	37	46	63	17	Same as S-17B, hard (CL)		
70											Bottom of boring at 70.0'. Offset boring drilled to obtain pitcher samples. See boring log for CP-4A.	
75												Groundwater monitoring well installed with screen at 29.0-39.0'. See well installation log. Surface restored with topsoil and seed.

BORING LOG

BORING NUMBER: CP-4A

SHEET NUMBER: 1 of 3

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: College Park, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DRILLING METHOD: Mud Rotary Wash using Revert

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: Median on Regents Drive at Campus Drive

COORD. N: 480,946.0 E: 1,329,345.0






STN. NO.: OFFSET:

SURFACE ELEV.: 96.7 feet

DATUM: Not surveyed/Approx. locations

START DATE: 7/2/07 TIME: 1:30 pm

FINISH DATE: 7/3/07 TIME: 11:00 am

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
	4"			2.87"							
	4.5"			3"							
	5.0'			36"							
	300lbs		Drill Rod Size								
	30"		I.D. (O.D.)								

[illegible]



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Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **CP-4A**

SHEET NUMBER: 2 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.		
			P	1		16.0 - 19.0						21	Moist, medium stiff, mottled gray and brown, CLAY with visible slickensides and/or fissures (CL)	
20														
25														
30														
35														



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **CP-4A**

SHEET NUMBER: 3 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **College Park, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
40			P	2	41.0 - 44.0						15	Moist, medium stiff, mottled reddish brown and yellow, CLAY (CL)	
45												44 52.7	Boring tremie grouted with cement grout through drill rods upon completion. Surface restored with topsoil and seed.
50													
55													



Appendix Q
College Park Groundwater
Observation Well Construction
Logs and Readings

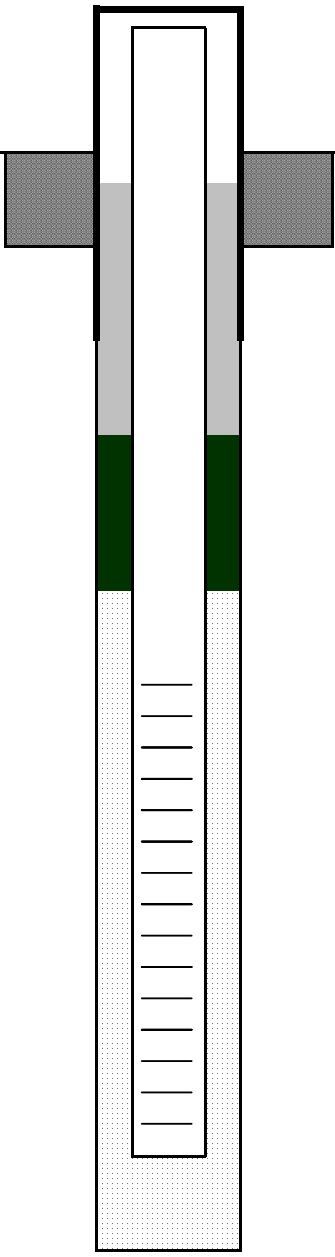


Parsons
Brinckerhoff

100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	CP-2A
Project Name:	Purple Line	Driller:	J. Sies	Date Installed:	6/26/2007
Project Location:	College Park, MD	Ground EL:	(feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	(feet)	Page:	1 of 1

	SURFACE SEAL: _____ (Thickness & Type) cement grout and quikrete
	BACKFILL MATERIAL: _____ (Type) cement grout
	TOP OF SEAL: _____ (feet) 53.0
	SEAL CONSTRUCTION: _____ (Thickness & Type) bentonite pellets
	TOP OF SANDPACK: _____ (feet) 57.0
	RISER CONSTRUCTION: _____ (Type, Diameter & Material) 2" Ø pvc
	TOP OF SCREEN: _____ (feet) 66
	SANDPACK TYPE: _____ #2 Silica Sand
	SCREEN MATERIAL: _____ (Type, Slot, Diameter & Material) 2" Ø pvc with 0.02" machine slots
	BOTTOM OF SCREEN: _____ (feet) 76
BOTTOM OF BOREHOLE: _____ (feet) 79	
BOREHOLE DIAMETER: _____ (inch) 5	

Remarks:

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-3784

WATER WELL ABANDONMENT-SEALING REPORT FORM

SUBMIT COPIES OF COMPLETED FORM TO:

- * COUNTY ENVIRONMENT AGENCY (contact MDE, WMA if address needed)
- * WELL OWNER
- * MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 09-04-07 (month/day/year)



* PERMIT NUMBER OF ABANDONED WELL (if any)

* PERMIT NUMBER OF REPLACEMENT WELL

* PERSON ABANDONING WELL: Brenard J. Taylor WELL DRILLERS LICENSE NUMBER: 430
CIRCLE: MWD/MSD/MGD

* OWNER'S NAME: MTA (Metro)

* WELL LOCATION: Union Drive College Pk. Md.

* COUNTY: Prince George's

* NEAREST TOWN: College Park

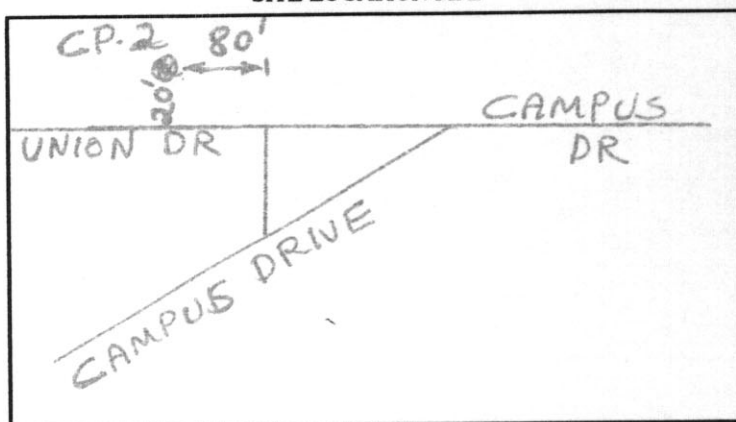
* TAX MAP _____ BLOCK _____ PARCEL _____

* SUBDIVISION: _____

* SECTION: _____ LOT: _____

* NEAREST ROAD: Union Drive

SITE LOCATION MAP



* TYPE OF WELL BEING ABANDONED:

____ DRILLED _____ JETTED
☒ BORED/AUGERED _____ HAND DUG
____ OTHER (specify) _____

* USE CODE:

____ DOMESTIC _____ MUNICIPAL/PUBLIC
____ IRRIGATION _____ INDUSTRIAL
☒ TEST/OBSERVATION _____ GEOTHERMAL

* TYPE OF CASING:

____ STEEL _____ ☒ PLASTIC
____ CONCRETE _____ OTHER (specify) _____

* SIZE OF CASING: 2 INCHES IN DIAMETER

* DEPTH OF WELL: 79 FEET DEEP

* WAS ANY CASING REMOVED? ☒ YES _____ NO
if yes, length removed, in feet: 5

* WAS CASING RIPPED OR PERFORATED? _____ YES _____ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Top Soil	0	1'
Bentonite	1'	
Mixed Grout		79
VOLUME OF MATERIAL USED		
3-94 lb Bags Portland 15 lb Bentonite 18 gal Water		

SIGNATURE-MASTER WELL DRILLER OR SUPERVISING SANITARIAN

LICENSE #

CIRCLE ONE

DATE

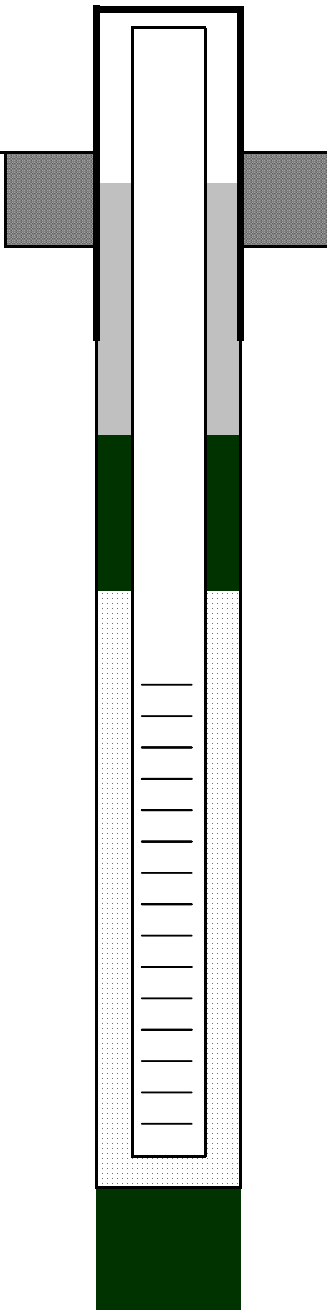


Parsons
Brinckerhoff

100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	CP-4
Project Name:	Purple Line	Driller:	J. Sies	Date Installed:	7/2/2007
Project Location:	College Park, MD	Ground EL:	(feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	(feet)	Page:	1 of 1

	SURFACE SEAL: (Thickness & Type)	cement grout and quikrete
	BACKFILL MATERIAL: (Type)	cement grout
	TOP OF SEAL:	(feet) 4.0
	SEAL CONSTRUCTION: (Thickness & Type)	bentonite pellets
	TOP OF SANDPACK:	(feet) 26.0
	RISER CONSTRUCTION: (Type, Diameter & Material)	2" Ø pvc
	TOP OF SCREEN:	(feet) 29
	SANDPACK TYPE:	#2 Silica Sand
	SCREEN MATERIAL: (Type, Slot, Diameter & Material)	2" Ø pvc with 0.02" machine slots
	BOTTOM OF SCREEN:	(feet) 39

BOTTOM OF BOREHOLE:	(feet) 70
BOREHOLE DIAMETER:	(inch) 5

Remarks: seal of bentonite chips from bottom of borehole to two feet below bottom of screen



Appendix R

College Park Soil Laboratory

Test Data



LOGS OF PITCHER SAMPLES



The Robert B. Balter Company
Geotechnical and Environmental Engineers
Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
www.balterco.com

PITCHER SAMPLE LOG

BORING CP-2A: P-1

@ 23 - 26'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 6/25/07

REPORTED RECOVERY: 24 inches

DATE CUT & LOGGED: 8/12/07

MEASURED RECOVERY: 21 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
24	24.0			Filter Sand (Packing Material)	0.5	
25			CH	Moist, Mottled Red, Brown and Gray, Very Stiff below 25 feet, Medium Stiff to Soft CLAY, little fine to medium Sand. Drilling Rotational disturbance observed on the sample.		CIUC @ 10 psi CIUC @ 25psi
26	25.9			Cut and discard. Material disturbed.	2.3	CIUC @ 50psi. Not Performed. Rotational disturbance.

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.



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Geotechnical and Environmental Engineers
Materials and Construction Inspection and Testing
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www.balterco.com

PITCHER SAMPLE LOG

BORING CP-2A: P-2

@ 33 - 36'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 6/25/07

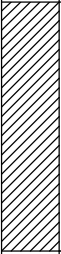
REPORTED RECOVERY: 18 inches

DATE CUT & LOGGED: 7/30/07

MEASURED RECOVERY: 10 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
34				Filter Sand (Packing Material)		
35	35.0			Material disturbed. Cut and Discarded		
	35.3		CL	Moist, Mottled Gray, Red and Dark Reddish Brown, Hard, CLAY, trace fine Sand. Fissures visible after extrusion of sample.	4.25	Proposed Tests (CIUC) not performed because of low recovery: Less than 10 inches
36	35.9			Cut and Discarded. Material Disturbed.		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-0 E2CR-PURPLE LINE.GPJ ROBERT B BALTER.GDT 10/17/07



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PITCHER SAMPLE LOG

BORING CP-2A: P-4

@ 76 - 79'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 6/26/07

REPORTED RECOVERY: 24 inches

DATE CUT & LOGGED: 7/30/07

MEASURED RECOVERY: 24 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
77	77.0			Filter Sand (Packing Material).	0.8	
78			CH	Moist, Dark Reddish Brown, Medium Stiff to Soft CLAY. Stiffer at 78.75 ft. and softer at 77 ft. See pocket penetrometer values. Consistency; from stiff to soft due to possible effect of drilling fluid. Material appears to have been rotationally disturbed during sampling. Pockets of very wet Clay mixed with lumps of drier (stiffer) Clay. Not Homogeneous. Bottom 3" Stiff CLAY.		CIUC @ 125 psi CIUC @ 25 psi CIUC @50 psi
79	78.8			Cut and discarded. Disturbed Material.	1.5	

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-0 E2CR-PURPLE LINE.GPJ ROBERT B BALTER.GDT 10/17/07



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PITCHER SAMPLE LOG

BORING CP-3A: P-1

@ 27 - 30'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 7/17/07

REPORTED RECOVERY: 21 inches

DATE CUT & LOGGED: 8/7/07

MEASURED RECOVERY: 18 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
28				Filter Sand (Packing Material)		
28.3					1.0	
29			CH	Moist, Mottled Red, Dark Brown and Gray, Very Stiff (softer towards top), CLAY, trace fine Sand with slickensides.		5 Cycle Residual Direct Shear @ 10, 25, 70 psi. Depth of tested samples 29'-29.5'
29.9					2.5	1D Consolidation Test (ASTM D2435). Depth of tested sample 29.6'
30				Cut and Discarded. Material Disturbed.		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-0 E2CR-PURPLE LINE.GPJ ROBERT B BALTER.GDT 10/17/07



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PITCHER SAMPLE LOG

BORING CP-3A: P-2

@ 50 - 53'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 7/17/07

REPORTED RECOVERY: 23.5 inches

DATE CUT & LOGGED: 8/17/07

MEASURED RECOVERY: 23 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
51				Filter Sand (Packing Material)		CIUC @ 100 psi
	51.3					CIUC @ 38 psi
52			CL	Moist, Dark Gray, Stiff to Hard, CLAY with lenses of Silt and fine Sand.	4.5+	CIUC @ 20 psi
					1.25	
53	52.9			Cut and Discarded. Material disturbed.		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-0 E2CR-PURPLE LINE.GPJ ROBERT B BALTER.GDT 10/17/07

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 7/17/07


REPORTED RECOVERY: 19.5 inches

DATE CUT & LOGGED: 8/7/07

MEASURED RECOVERY: 15.5 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
63				Filter Sand (Packing Material)		
64	63.8		CH	Moist, Dark Gray, medium stiff, slickensided and fissured CLAY with very thin Silt lenses and fine Sand.		1D Swell test (ASTM D4546). Depth of sample tested 64.5ft. 5 Cycle Residual Direct Shear at 20psi, 43psi and 110 psi. Depth of samples tested 64.5'-69'.
65	64.9			Cut and Discarded. Material disturbed.	2.2	

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.



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PITCHER SAMPLE LOG

BORING CP-3A: P-4

@ 100 - 103'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 7/18/07


REPORTED RECOVERY: 10 inches

DATE CUT & LOGGED: 8/22/07

MEASURED RECOVERY: 6 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
				Filter Sand (Packing Material)		
	102.0		CH	Moist, Mottled Red and Brown, medium stiff, CLAY, trace fine Sand. Very Soft towards the top.		
	102.8			Cut and Discarded. Material Disturbed.	0.75	Proposed CIUC Test not performed because the material recovered was not enough.

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 7/3/07


REPORTED RECOVERY: 21 inches

DATE CUT & LOGGED: 8/21/07

MEASURED RECOVERY: 21 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
17				Filter Sand (Packing Material)		
18	17.8		CH	Moist, Mottled Gray, Brown, Yellowish Brown, Very Stiff CLAY, some Sand. Impossible to distinguish structures such as slickensides, stratification or fissures because of drilling rotational disturbance.	3.25	5 Cycle Residual Direct Shear at 5, 15, 40 psi. Depth of samples tested 18.3'-18.8'
19	18.8			Cut and discarded. Material disturbed.		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.



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PITCHER SAMPLE LOG

BORING CP-4A: P-2

@ 41 - 44'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION College Park, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 7/3/07

REPORTED RECOVERY: 15 inches

DATE CUT & LOGGED: 8/27/07

MEASURED RECOVERY: 14 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

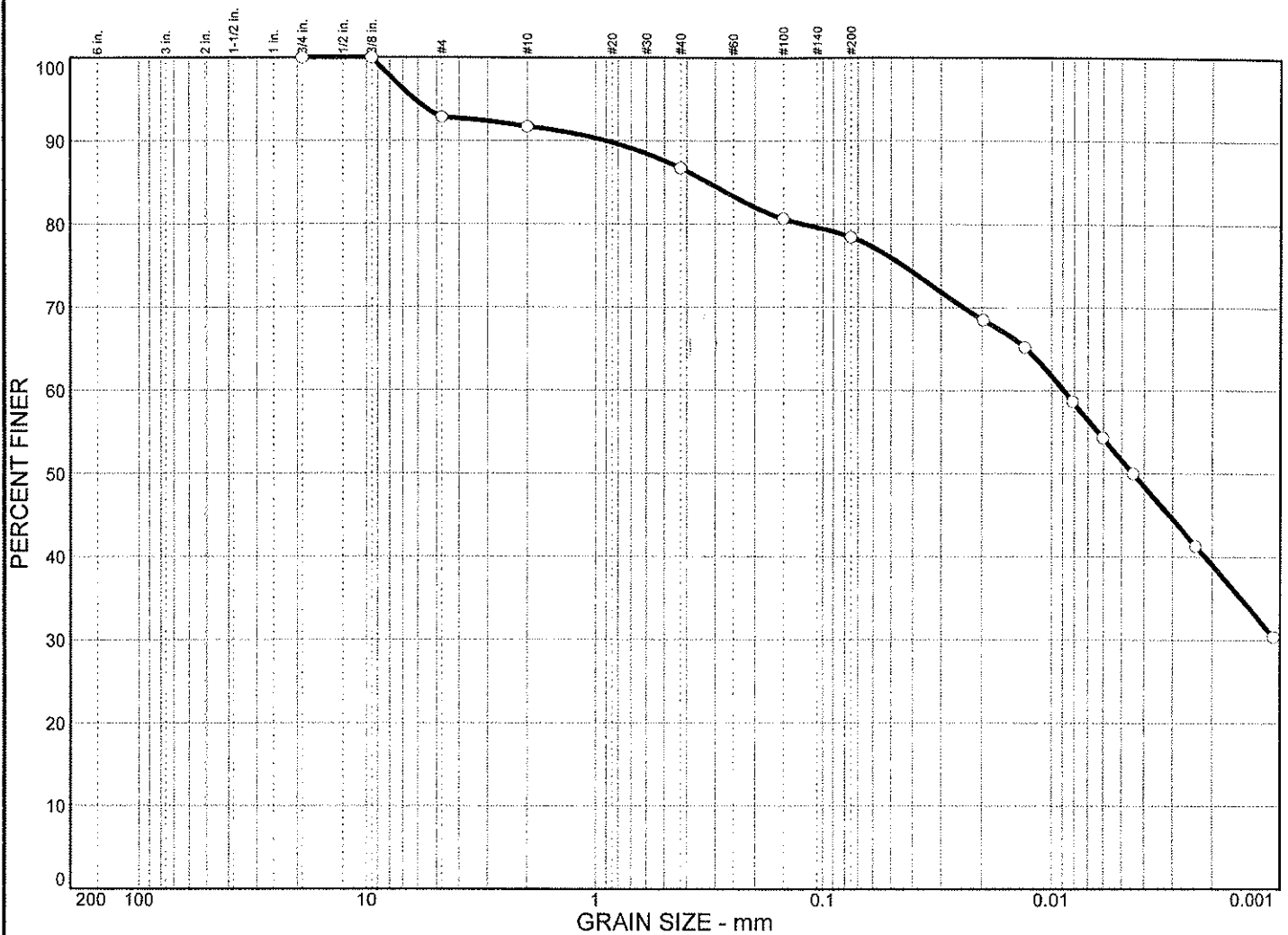
TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
42				Filter Sand (Packing Material)		
43	42.9 43.0		GP- GM	Moist, Yellow, Medium to Coarse Sandy Gravel.		CIUC Triaxial at 15psi
			CL	Moist, Mottled Reddish Brown and Yellow, Very Stiff CLAY, trace fine Sand. Uniform/homogenous material.		CIUC Triaxial at 60psi
44	43.9			Cut and Discarded. Material Disturbed.	4.25	

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.



CLASSIFICATION TEST RESULTS

Particle Size Distribution Report

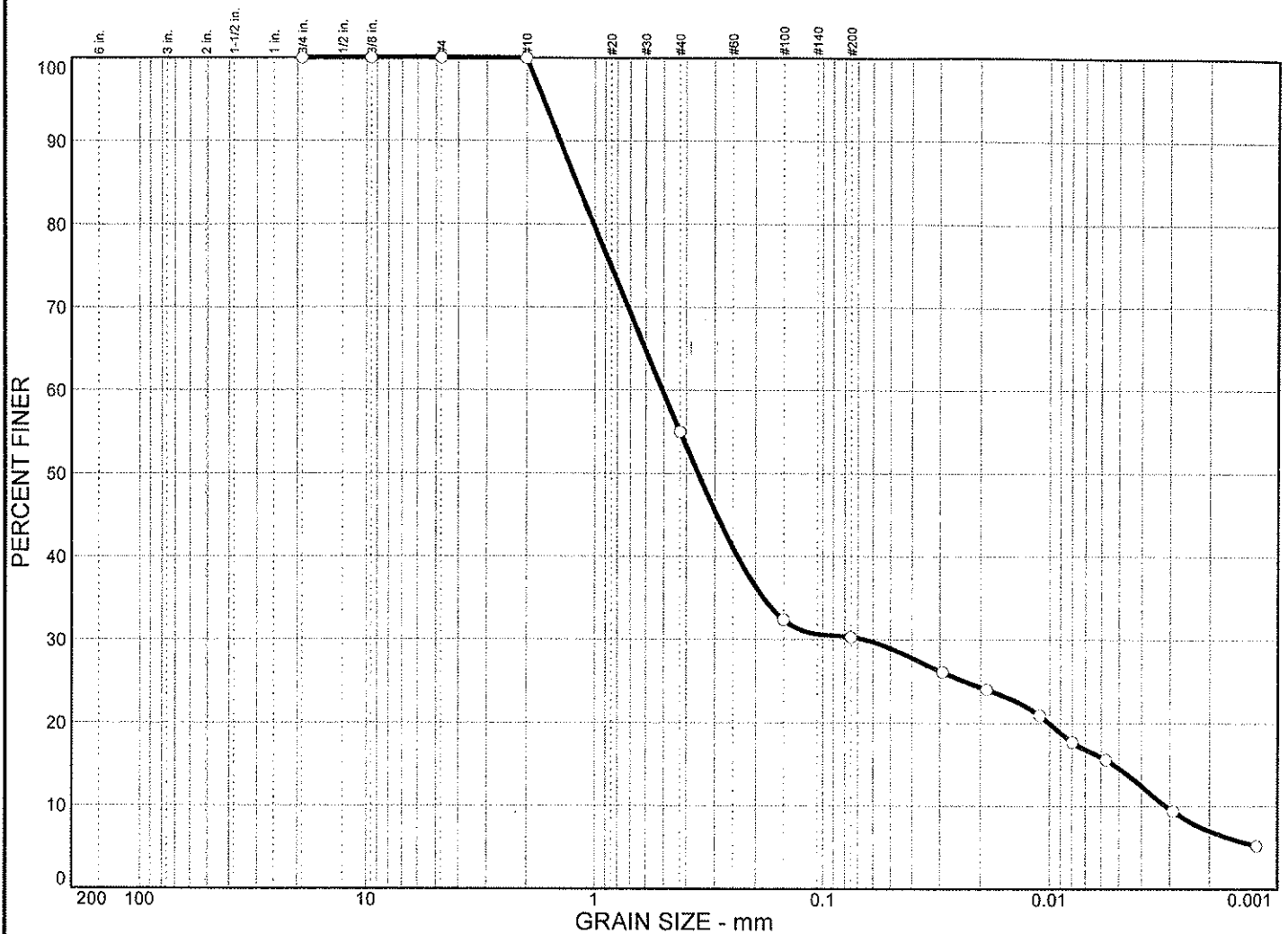


% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	7.2		14.4			26.8		51.6	
×	LL	PL	D85	D60	D50	D30	D15	D10	C _c	C _u
○	40	21	0.323	0.0089	0.0045					
MATERIAL DESCRIPTION									USCS	AASHTO
○ Red & Light Gray, Silty CLAY, little Sand, trace Gravel									CL	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-1 Sample No.: S-29 Elev./Depth: 57.0'-59.0'	Remarks: Natural Moisture = 19.5% PI : 19
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		69.7			15.7		14.6	
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	27	19	1.20	0.507	0.355	0.0656	0.0053	0.0031	2.73	162.97
MATERIAL DESCRIPTION									USCS	AASHTO
○ Tan & Light Brown, Clayey SAND, little Silt									SC	

Project No. 07503-04 **Client:** Mayland Transit Administration
Project: Purple Line
Source: CP-1 **Sample No.:** S-25/S-26 **Elev./Depth:** 49.0'-53.0'

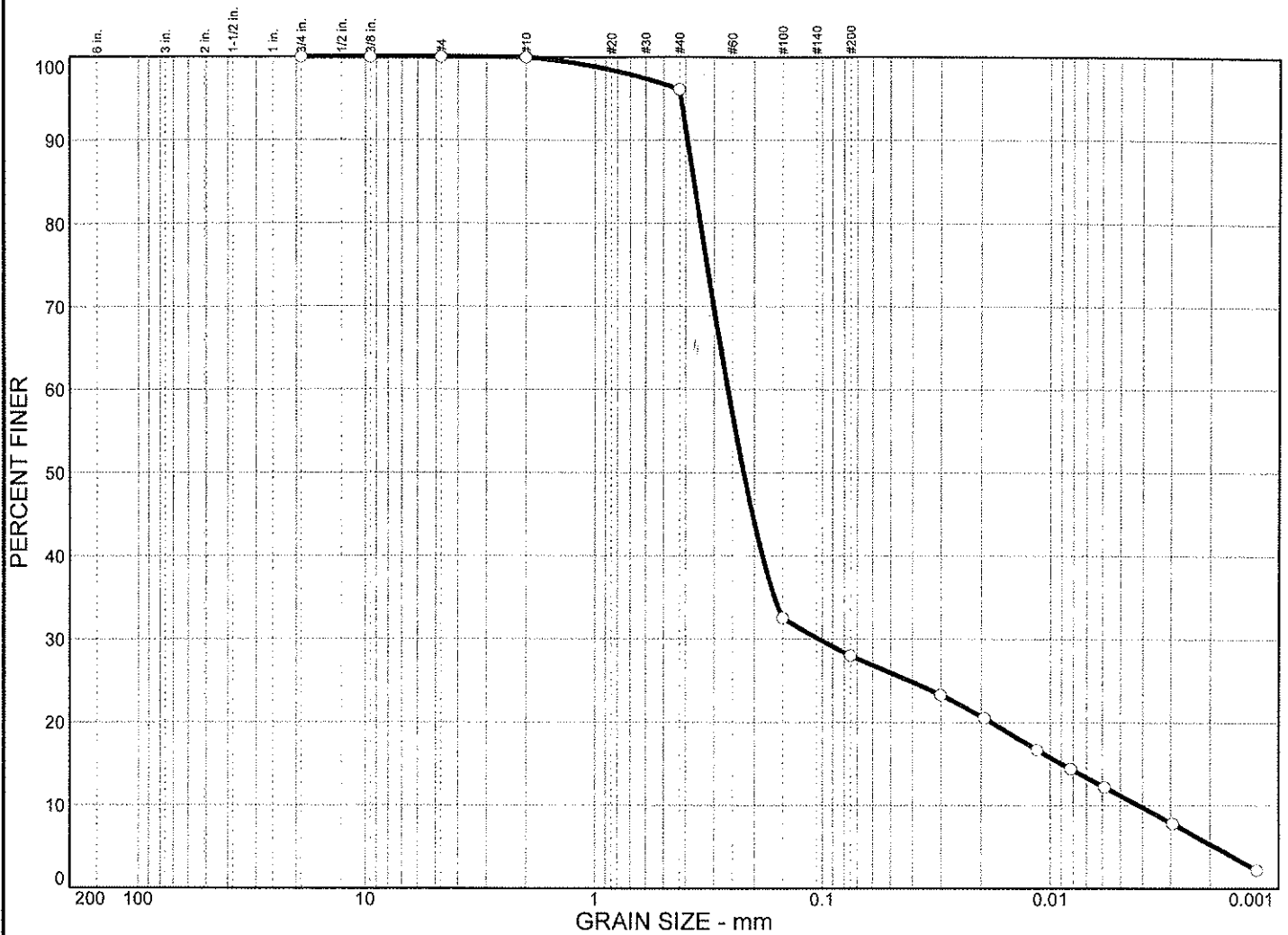
Particle Size Distribution Report

E2CR, Inc.

Remarks:
 Natural Moisture = 19.2%
 PI : 8

Figure

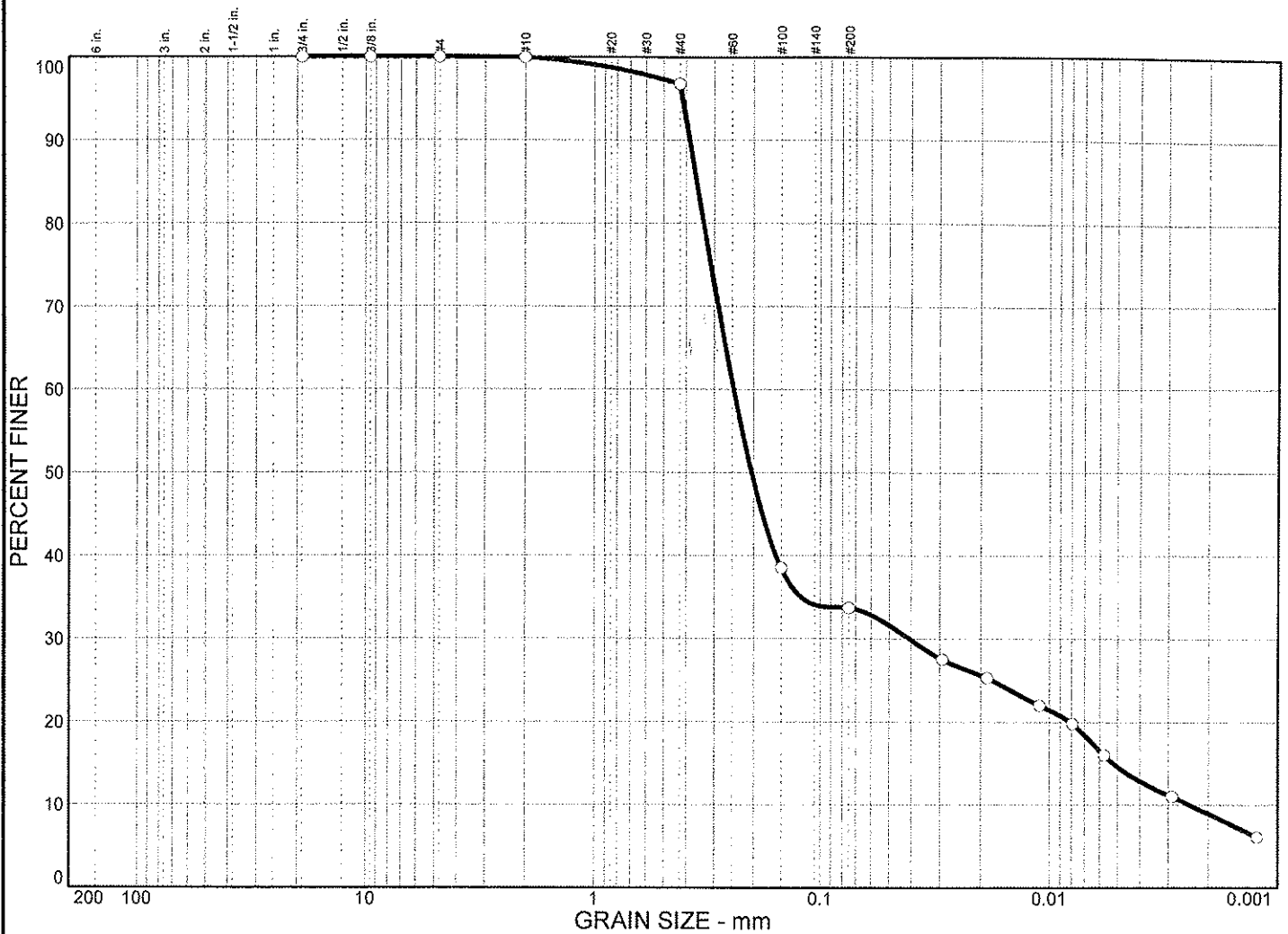
Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		72.0			16.8		11.2	
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	NP	NP	0.368	0.261	0.223	0.104	0.0089	0.0042	9.91	62.96
MATERIAL DESCRIPTION									USCS	AASHTO
○ Tan & Gray, Silty SAND, little Clayey									SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line		Remarks: ○ Natural Moisture = 23.1%
○ Source: CP-1 Sample No.: S-17 Elev./Depth: 33.0'-35.0'		
Particle Size Distribution Report E2CR, Inc.		Figure

Particle Size Distribution Report

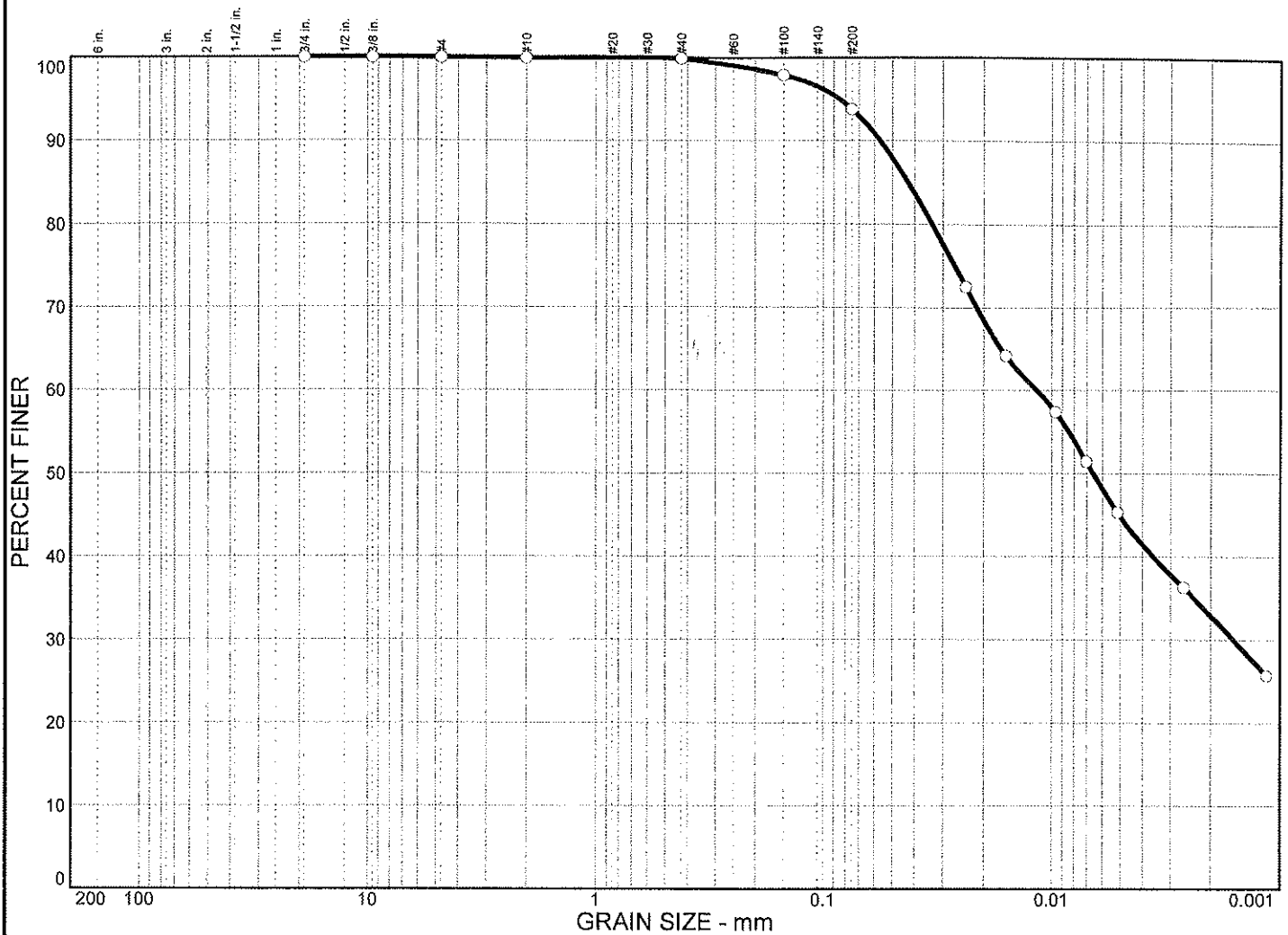


% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		66.3			19.1		14.6	
×	LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu
○	NP	NP	0.360	0.245	0.204	0.0408	0.0052	0.0024	2.81	101.81
MATERIAL DESCRIPTION								USCS	AASHTO	
○ Light Tan & Light Orange Brown, Silty SAND, little Clay								SM		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-1 Sample No.: S-14/S-15 Elev./Depth: 27.0'-31.0'	Remarks: Natural Moisture = 22.8%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	6.2	49.0	44.8
cc				

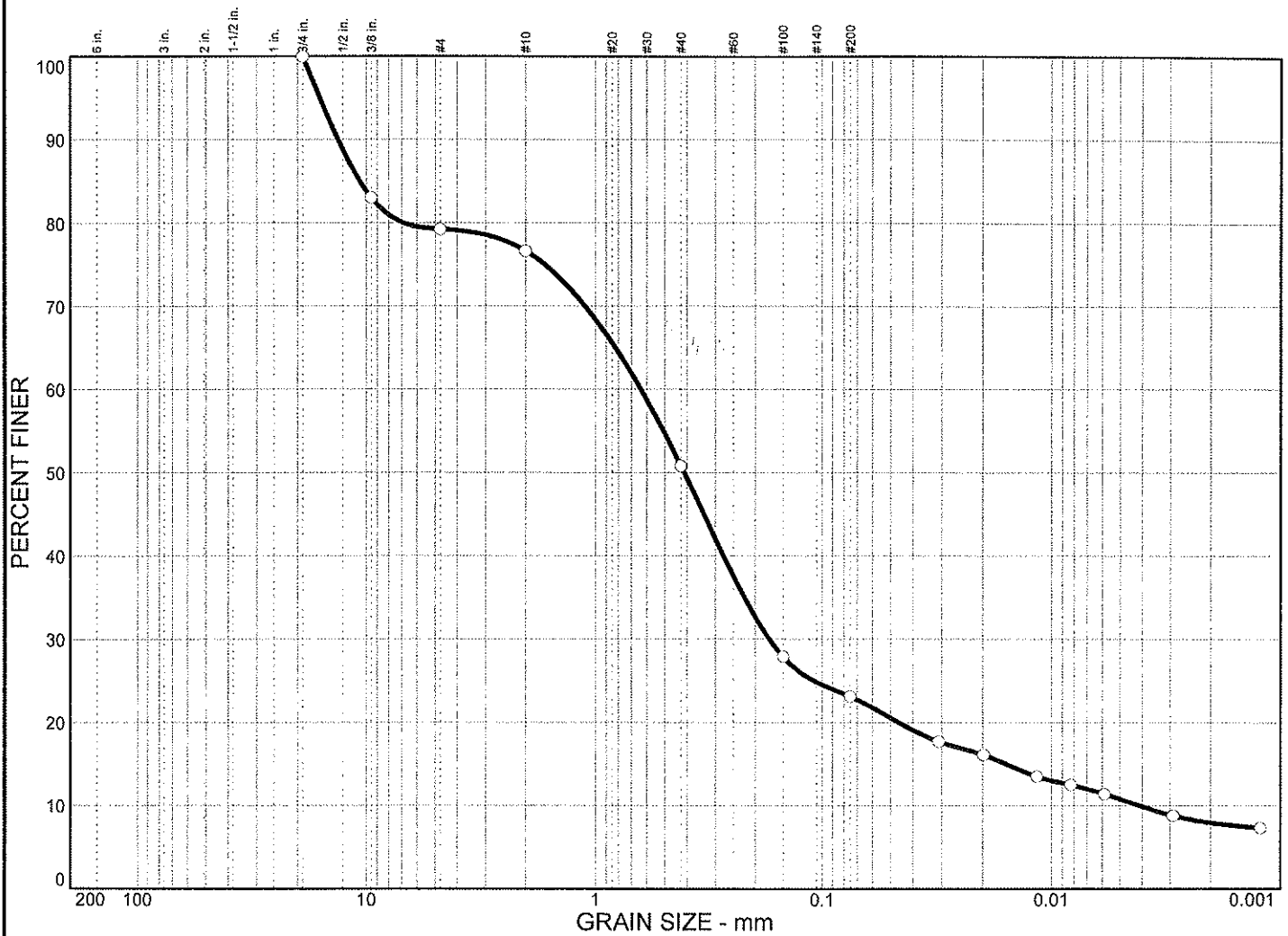
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
54	27	0.0427	0.0116	0.0066	0.0016				

MATERIAL DESCRIPTION	USCS	AASHTO
○ Reddish Brown & Gray, CLAY and SILT, trace Sand	CH	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line ○ Source: CP-1 Sample No.: S-10 Elev./Depth: 19.0'-21.0'	Remarks: ○ Natural Moisture = 24.2% PI : 27
<div>Particle Size Distribution Report</div> <div>E2CR, Inc.</div>	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	20.8		56.1			12.3		10.8	
×	LL	PL	D85	D60	D50	D30	D15	D10	C _c	C _u
○	20	13	10.7	0.637	0.411	0.173	0.0158	0.0041	11.44	155.78
MATERIAL DESCRIPTION								USCS	AASHTO	
○ Medium Brown, Silty to Clayey SAND, some Garvel								SC-SM		

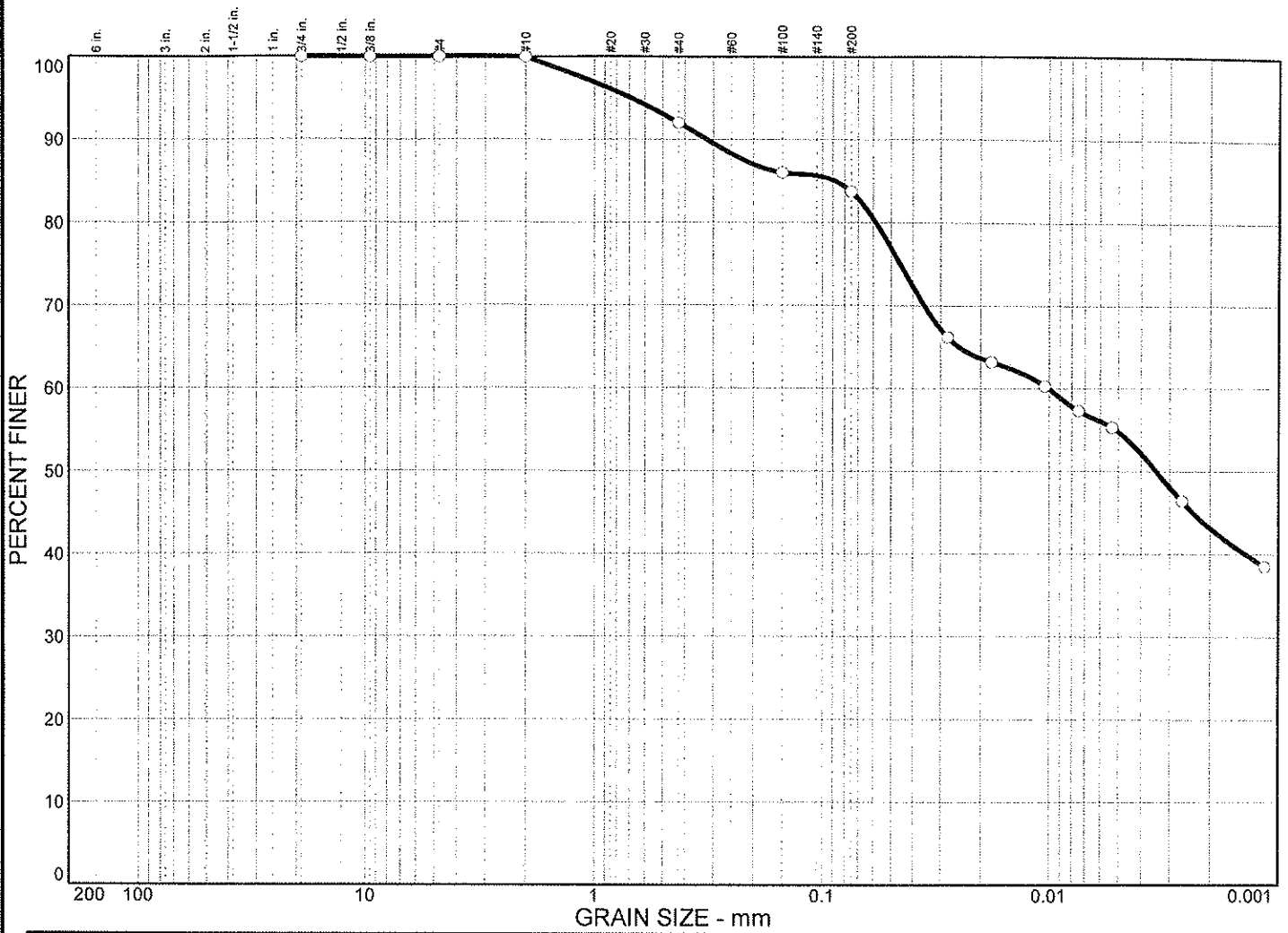
Project No. 07503-04 **Client:** Mayland Tranit Administration
Project: Purple Line
Source: CP-1 **Sample No.:** S-4 **Elev./Depth:** 70.0'-90.0'

Particle Size Distribution Report
E2CR, Inc.

Remarks:
 ○ Natural Moisture = 7.9%
 PI : 7

Figure

Particle Size Distribution Report

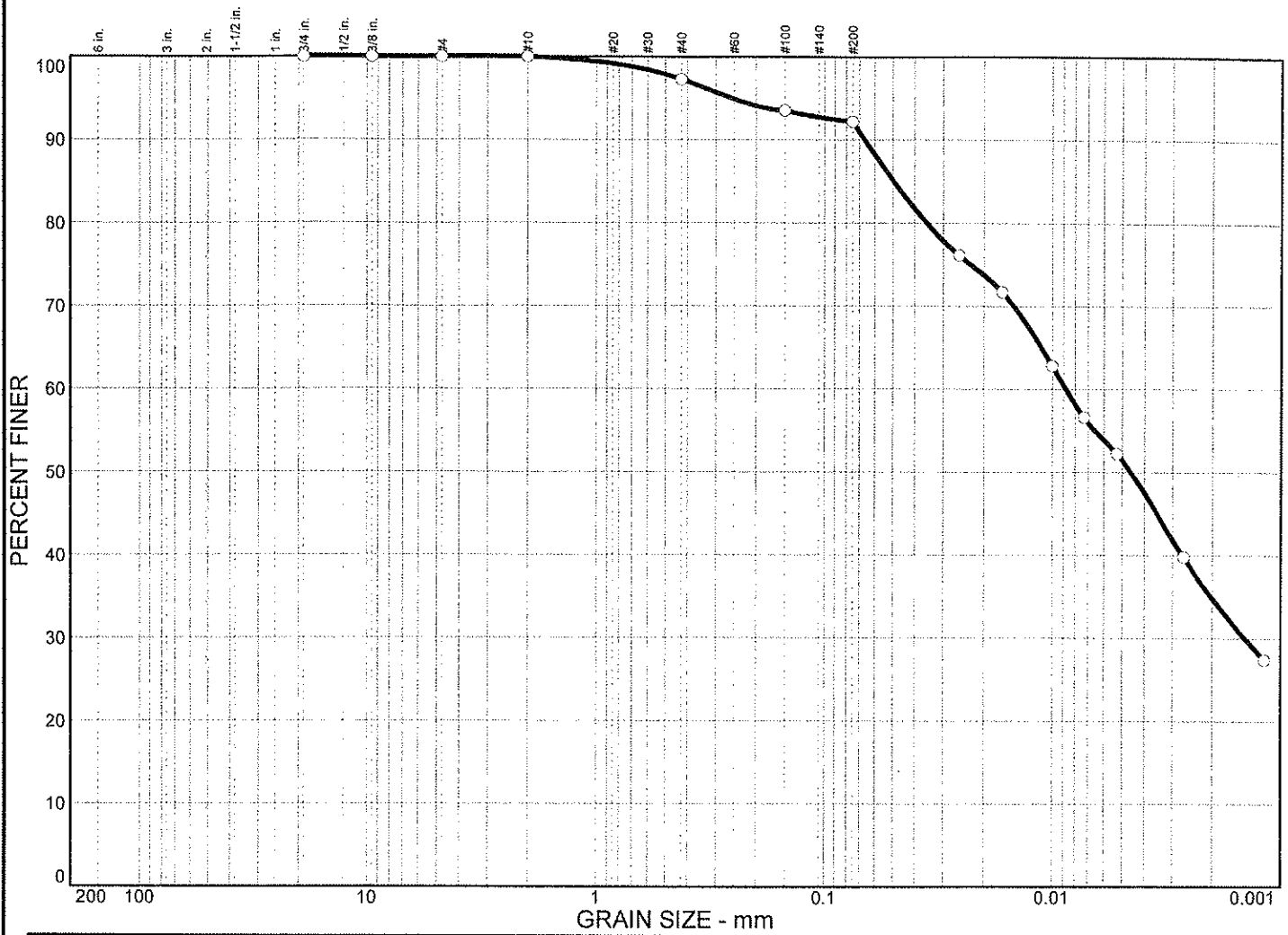


% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		16.3			28.9		54.8	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	74	25	0.0882	0.0101	0.0034					
MATERIAL DESCRIPTION								USCS	AASHTO	
○ Red and Dark Brown, Silty Clay, little Sand								CH		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-2 Sample No.: S-5/S-6 Elev./Depth: 20.0'-24.0'	Remarks: Natural Moisture = 23.7% PI = 49
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		7.8			40.8		51.4	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	48	20	0.0494	0.0088	0.0046	0.0014				
MATERIAL DESCRIPTION								USCS	AASHTO	
○ Reddish Brown, CLAY and SILT, trace Sand								CL		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-2 Sample No.: S-12 Elev./Depth: 34.0'-36.0'	Remarks: Natural Moisture : 16.3% PI : 28
Particle Size Distribution Report E2CR, Inc.	

Figure

Grain size distribution curve showing Percent Finer versus Grain Size (mm). The curve indicates that approximately 100% of the material is finer than 2.0 mm, and the distribution follows a typical pattern for a fine-grained soil.

Grain Size (mm)	Percent Finer (%)
200	100
100	100
60	100
40	100
30	100
25	100
20	100
15	100
12.5	100
10	100
7.5	100
6	100
4.75	100
3.75	100
3.0	100
2.5	100
2.0	100
1.5	100
1.18	100
0.85	100
0.75	100
0.60	100
0.425	35
0.30	25
0.25	20
0.20	18
0.15	17
0.125	16
0.10	15
0.075	14
0.060	13
0.050	12
0.040	11
0.030	10
0.025	9
0.020	8
0.015	7
0.0125	6
0.010	5
0.0075	4
0.0060	3
0.0050	2
0.0040	1
0.0030	0
0.0025	0
0.0020	0
0.0015	0
0.00125	0
0.0010	0
0.00075	0
0.00060	0
0.00050	0
0.00040	0
0.00030	0
0.00025	0
0.00020	0
0.00015	0
0.000125	0
0.00010	0
0.000075	0
0.000060	0
0.000050	0
0.000040	0
0.000030	0
0.000025	0
0.000020	0
0.000015	0
0.0000125	0
0.000010	0
0.0000075	0
0.0000060	0
0.0000050	0
0.0000040	0
0.0000030	0
0.0000025	0
0.0000020	0
0.0000015	0
0.00000125	0
0.0000010	0
0.00000075	0
0.00000060	0
0.00000050	0
0.00000040	0
0.00000030	0
0.00000025	0
0.00000020	0
0.00000015	0
0.000000125	0
0.00000010	0
0.000000075	0
0.000000060	0
0.000000050	0
0.000000040	0
0.000000030	0
0.000000025	0
0.000000020	0
0.000000015	0
0.0000000125	0
0.000000010	0
0.0000000075	0
0.0000000060	0
0.0000000050	0
0.0000000040	0
0.0000000030	0
0.0000000025	0
0.0000000020	0
0.0000000015	0
0.00000000125	0
0.0000000010	0
0.00000000075	0
0.00000000060	0
0.00000000050	0
0.00000000040	0
0.00000000030	0
0.00000000025	0
0.00000000020	0
0.00000000015	0
0.000000000125	0
0.00000000010	0
0.000000000075	0
0.000000000060	0
0.000000000050	0
0.000000000040	0
0.000000000030	0
0.000000000025	0
0.000000000020	0
0.000000000015	0
0.0000000000125	0
0.000000000010	0
0.0000000000075	0
0.0000000000060	0
0.0000000000050	0
0.0000000000040	0
0.0000000000030	0
0.0000000000025	

[illegible]

MATERIAL DESCRIPTION	USCS	AASHTO
○ Gray and Yellow, SAND, little Silt	SC-SM	

Project No. 07503-04	Client: Mayland Transit Administration
Project: Purple Line	
Source: CP-2	Sample No.: S-14/S-15 Elev./Depth: 38.0'-42.0'

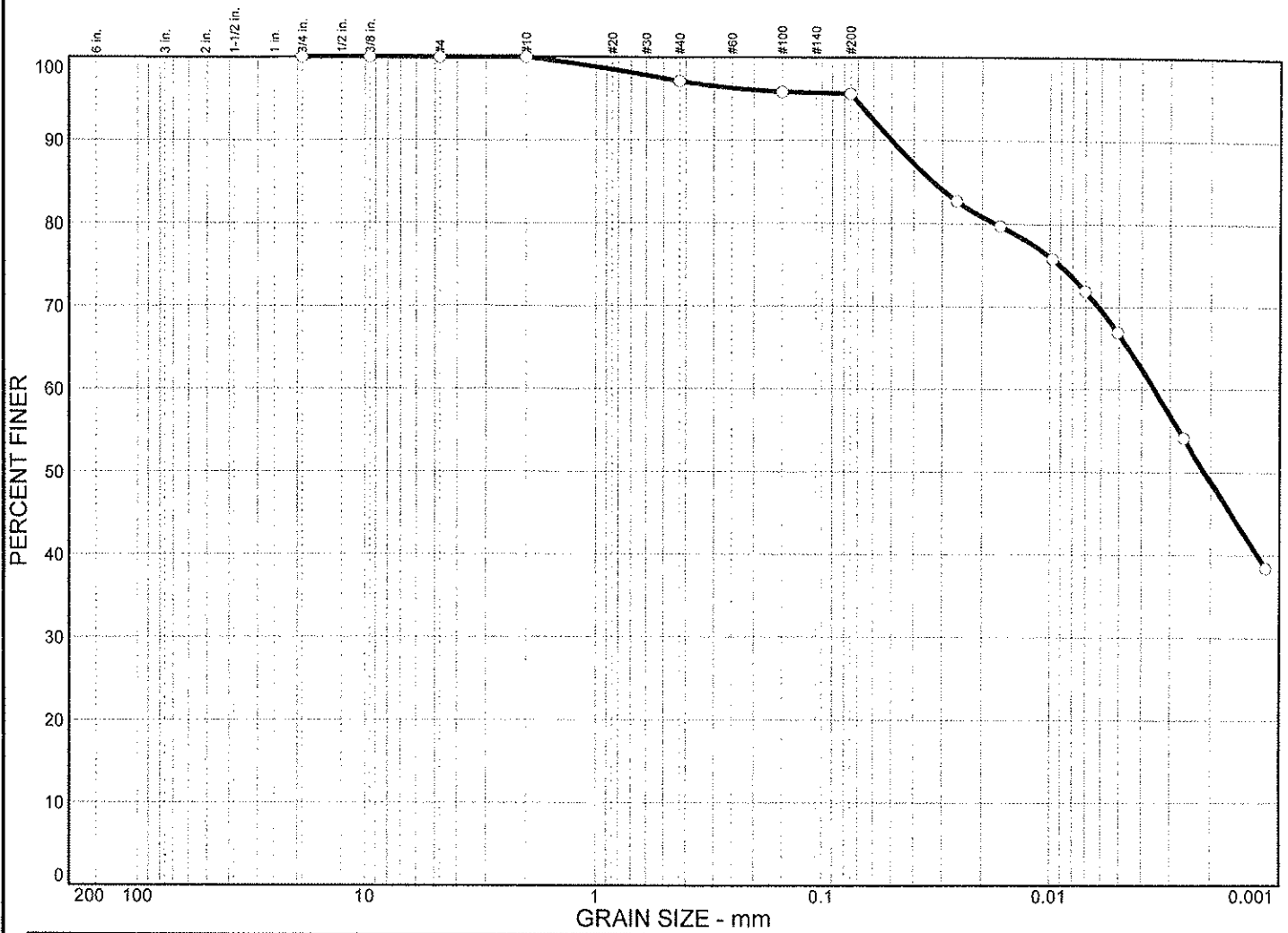
Remarks:
○ Natural Moisture = 13.4%
PI : 4

Particle Size Distribution Report

E2CR, Inc.

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	4.4	29.0	66.6

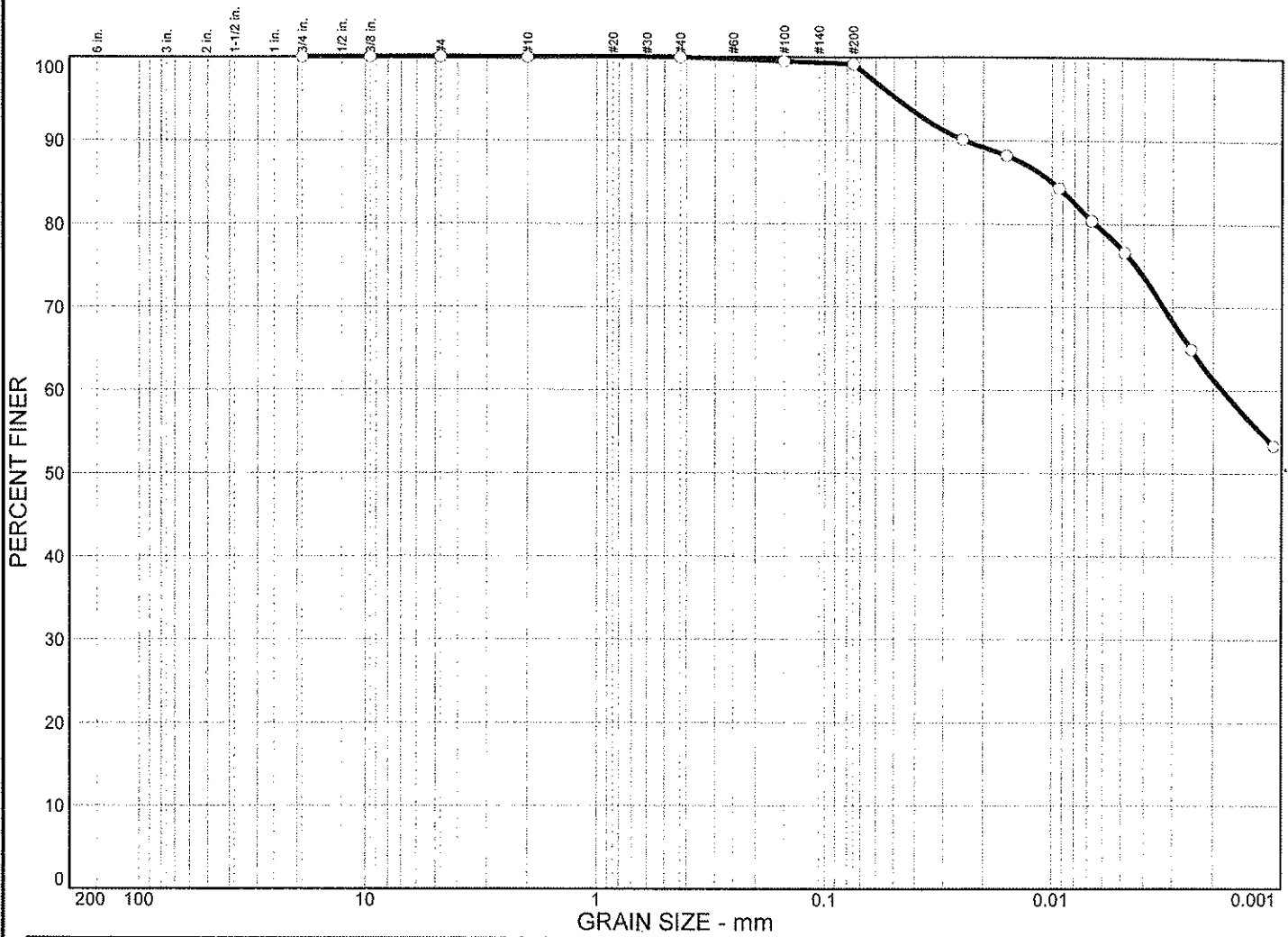
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
65	28	0.0330	0.0035	0.0021					

MATERIAL DESCRIPTION	USCS	AASHTO
Red and Brown, Silty Clay	CH	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-2 Sample No.: S-23 Elev./Depth: 56.0'-58.0'	Remarks: Natural Moisture : 23.5% PI : 37
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report

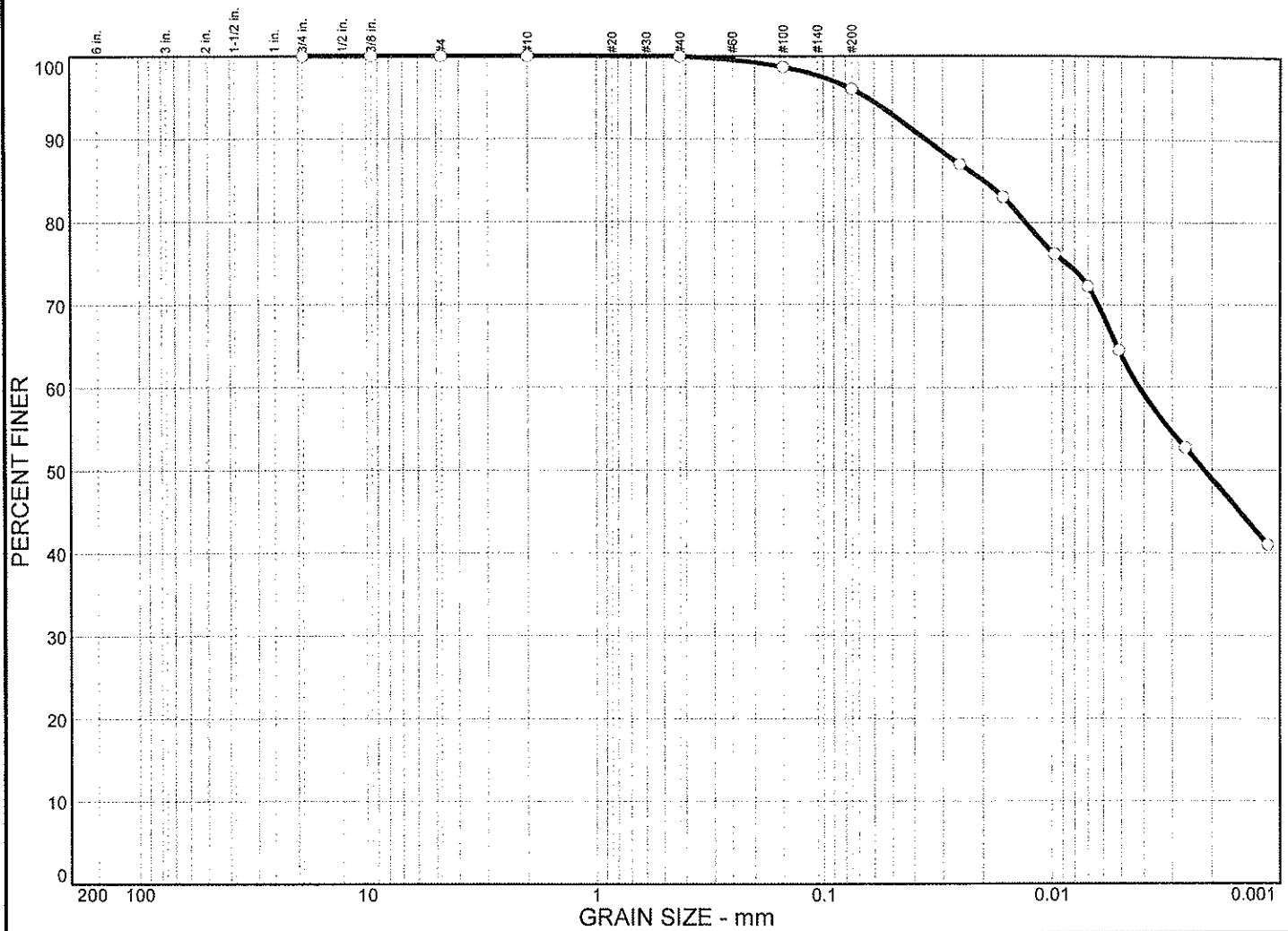


% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		0.8			22.2		77.0	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	63	25	0.0100	0.0018						
MATERIAL DESCRIPTION								USCS	AASHTO	
○ Dark Brown, Silty CLAY								CH		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-2 Sample No.: S-33 Elev./Depth: 76.0'-78.0'	Remarks: Natural Moisture : 20.7% PI : 38
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report

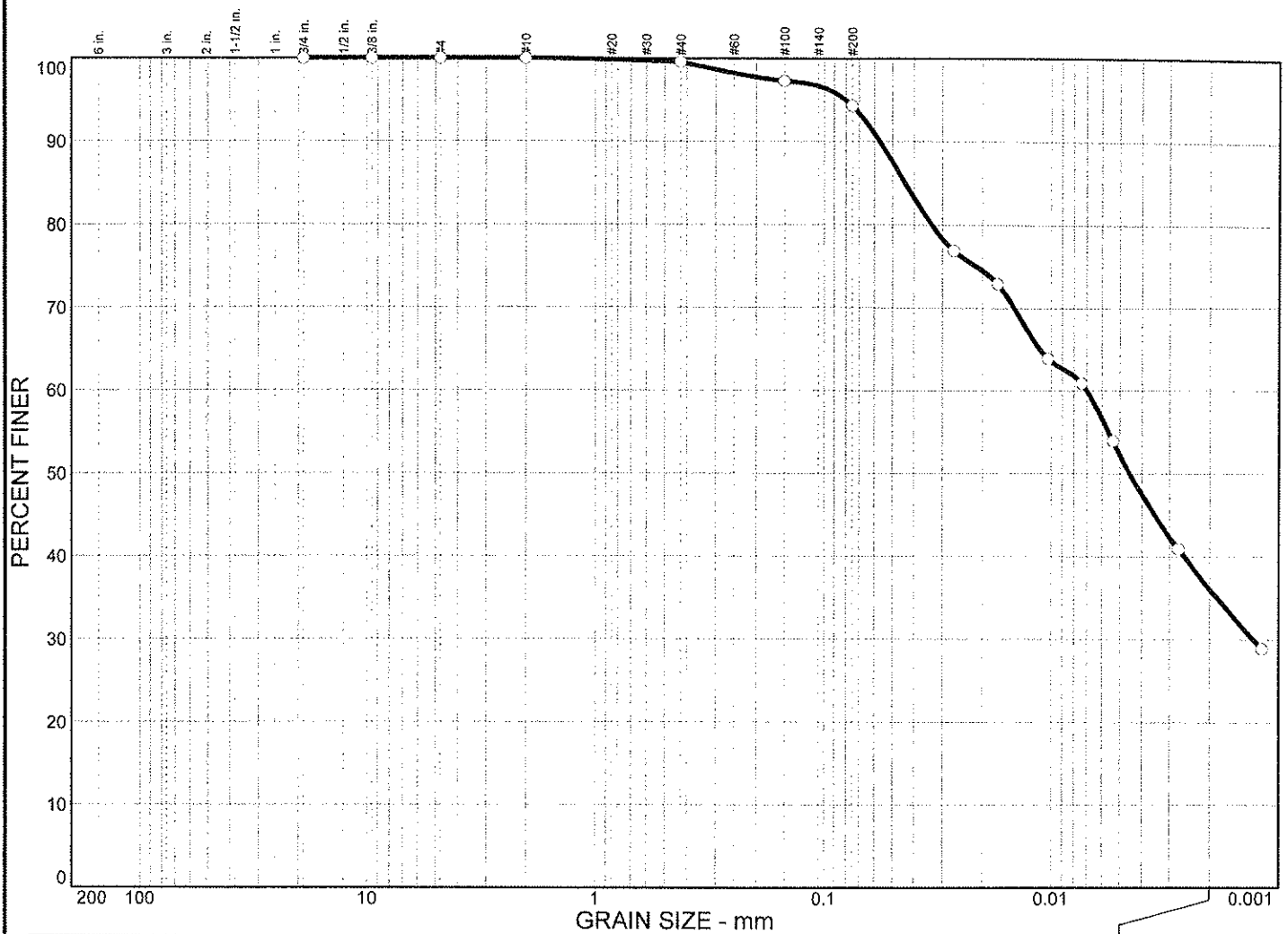


	% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0		0.0		4.0			32.1		63.9	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u	
○	63	27	0.0199	0.0042	0.0022						
MATERIAL DESCRIPTION									USCS		AASHTO
○ Reddish Brown, Silty CLAY									CH		

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-3 Sample No.: S-6 Elev./Depth: 28.0'-30.0'		Remarks: ○ Natural Moisture : 24.5% PI : 36
Particle Size Distribution Report E2CR, Inc.		

Figure

Particle Size Distribution Report

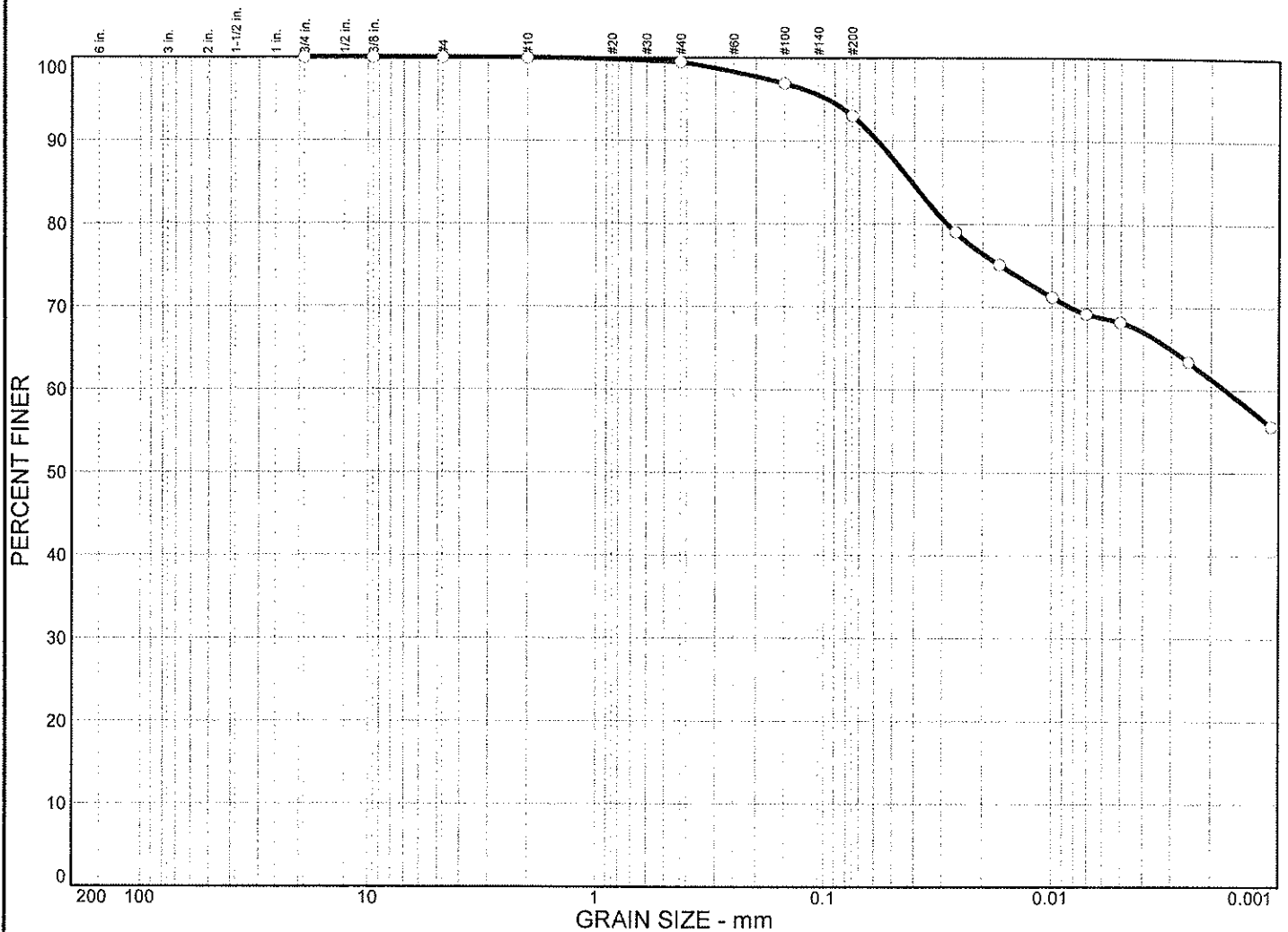


TEST DATA										
% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
0.0		0.0		5.7			58.3		36.0	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-3 Sample No.: S-17/S-18 Elev./Depth: 50.0'-54.0'	Remarks: Natural Moisture : 17.1 PI : 20
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



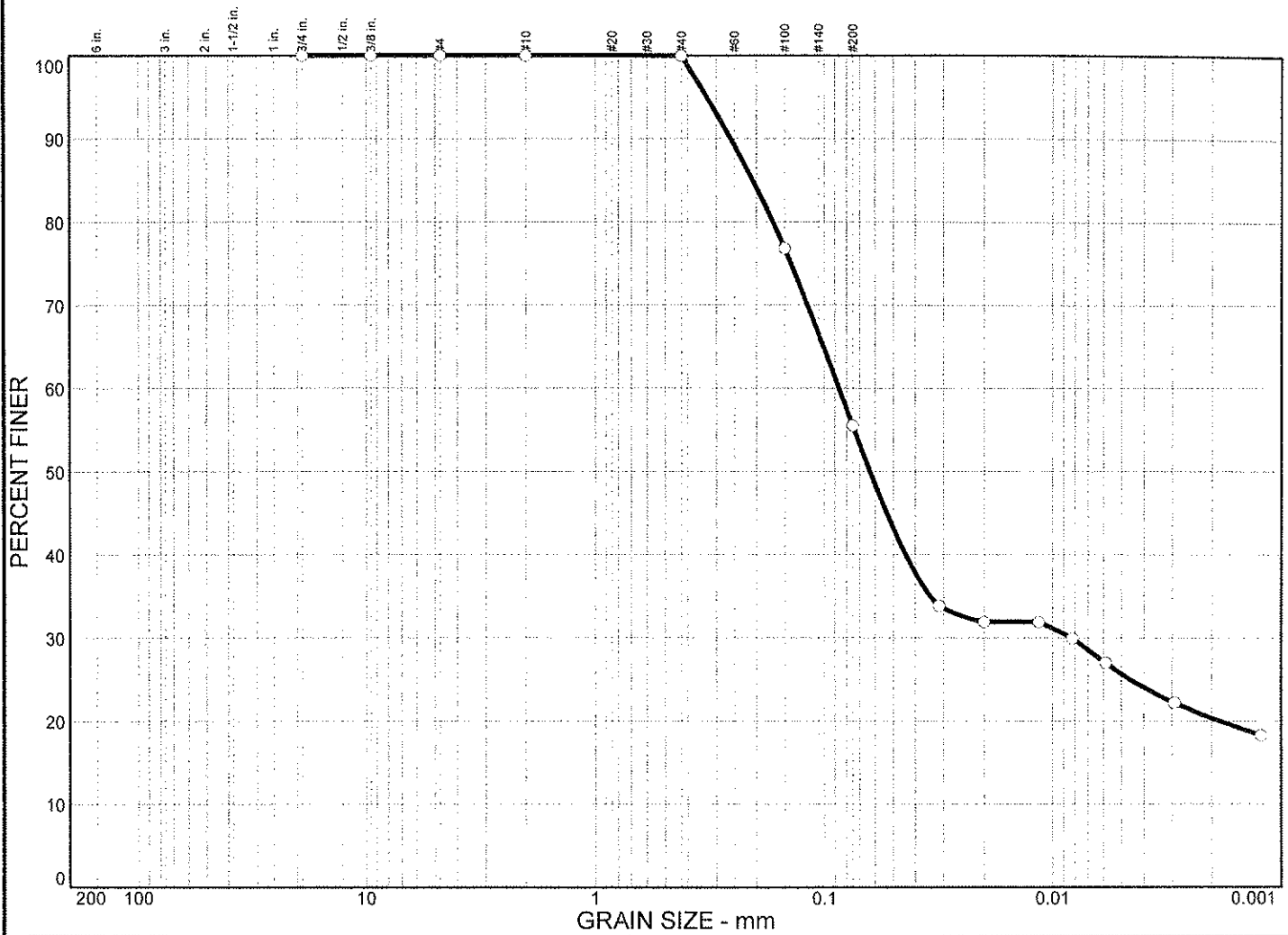
% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
○	0.0	0.0		7.0			24.8		68.2	
×	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
○	53	24	0.0410	0.0017						

MATERIAL DESCRIPTION							USCS	AASHTO
Dark Purple, Silty CLAY, trace Sand							CH	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-3 Sample No.: S-23 Elev./Depth: 62.0'-64.0'	Remarks: Natural Moisture : 23.7 PI : 29
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
0.0		0.0		44.5			29.8		25.7	
LL	PL	D85	D60	D50	D30	D15	D10	Cc	Cu	
27	15	0.207	0.0863	0.0630	0.0083					
MATERIAL DESCRIPTION								USCS	AASHTO	
Olive and Gray, Silty CLAY and SAND								CL		

Project No. 07503-04 Client: Mayland Transit Administration

Project: Purple Line

Source: CP-3

Sample No.: S-26

Elev./Depth: 68.0'-70.0'

Remarks:

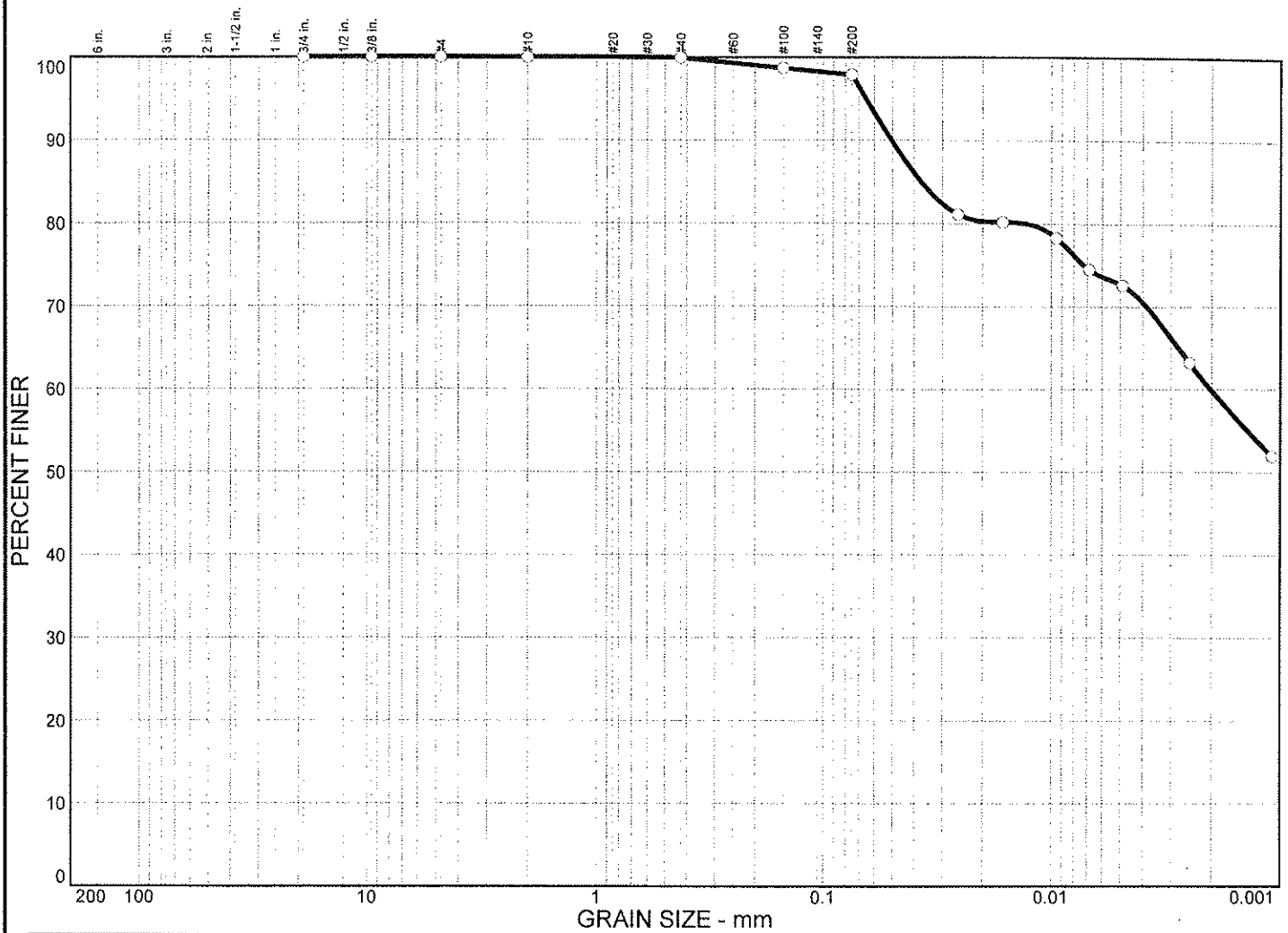
Natural Moisture : 19.0%
PI : 12

Particle Size Distribution Report

E2CR, Inc.

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	2.1	25.1	72.8

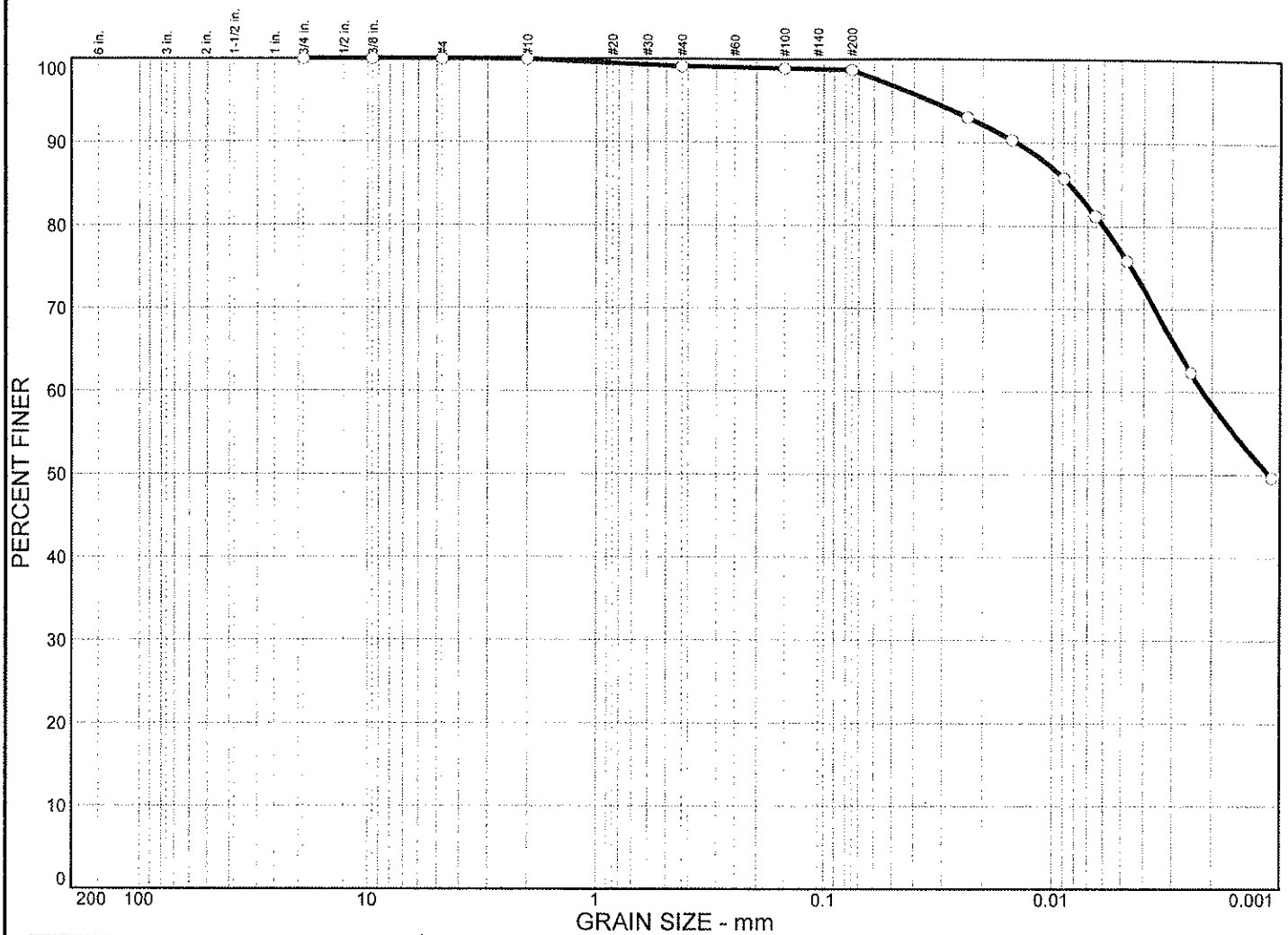
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
63	25	0.0372	0.0020						

MATERIAL DESCRIPTION	USCS	AASHTO
Grayish Red, Silty CLAY	CH	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-3 Sample No.: S-31 Elev./Depth: 78.0'-80.0'	Remarks: Natural Moisture : 20.8% PI : 38
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



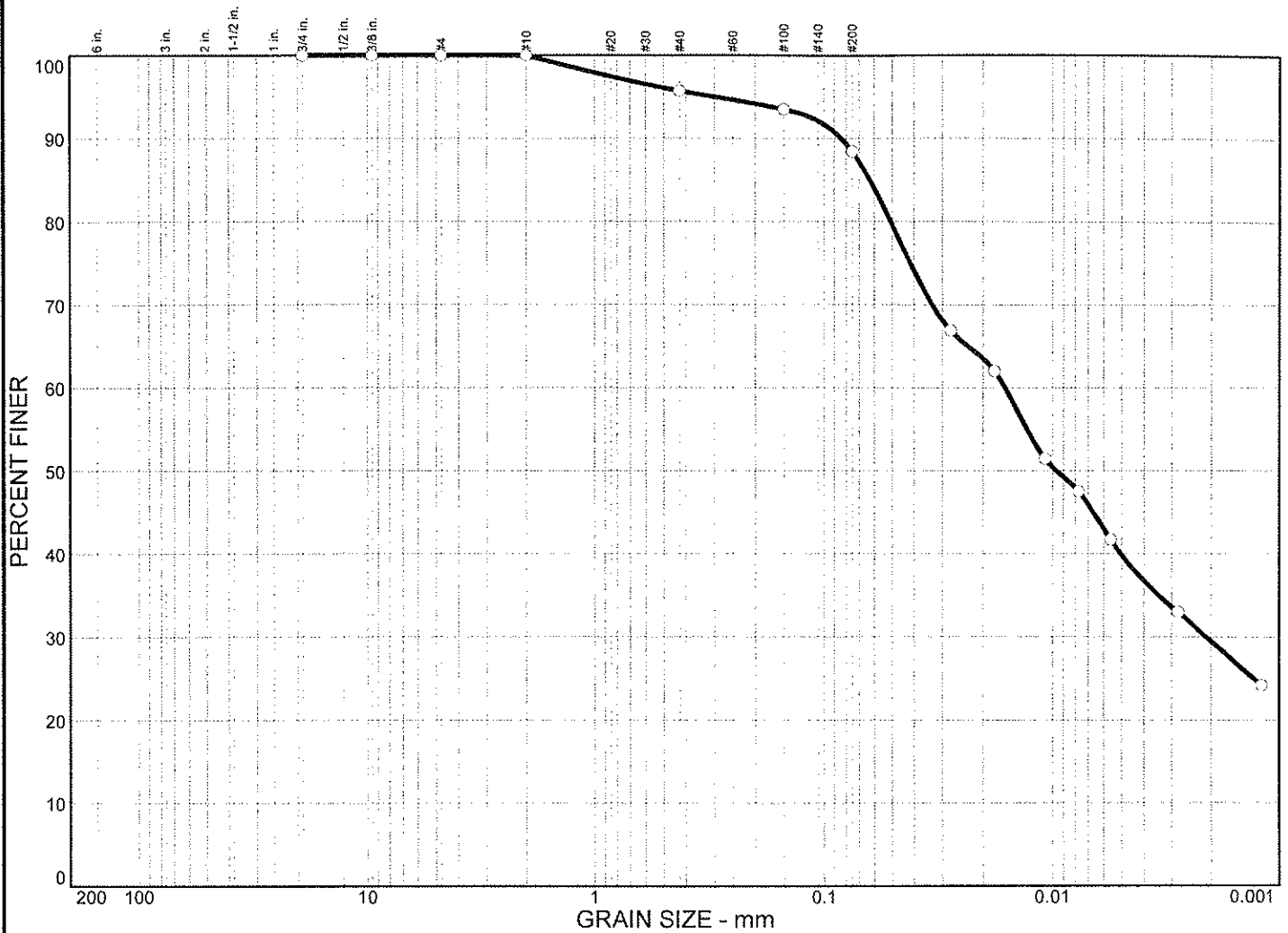
% COBBLES		% GRAVEL		% SAND			% SILT		% CLAY	
0.0		0.0		1.3			21.9		76.8	
X	LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
59		21	0.0084	0.0022	0.0011					

MATERIAL DESCRIPTION							USCS	AASHTO
Orange and Dark Purple, Silty CLAY							CH	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-3 Sample No.: S-40/S-41 Elev./Depth: 96.0'-100.0'	Remarks: Natural Moisture : 22.4% PI : 38
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	11.6	48.5	39.9

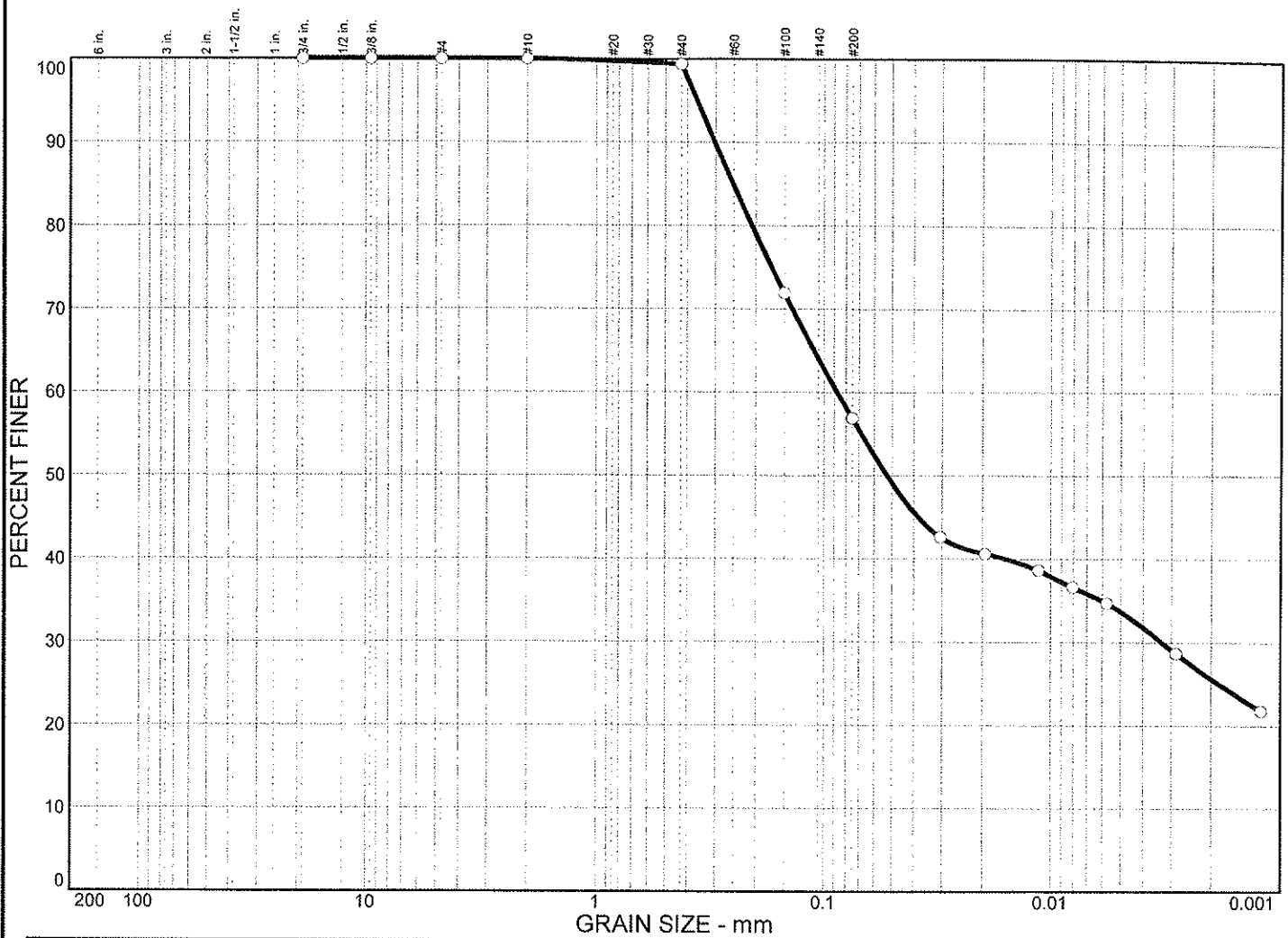
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
40	17	0.0628	0.0161	0.0097	0.0021				

MATERIAL DESCRIPTION	USCS	AASHTO
Reddish Brown, Sandy CLAY and SILT	CL	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-3 Sample No.: S-48/S-49 Elev./Depth: 112.0'-116.0'	Remarks: Natural Moisture : 13.4% PI : 23
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	43.1	23.2	33.7

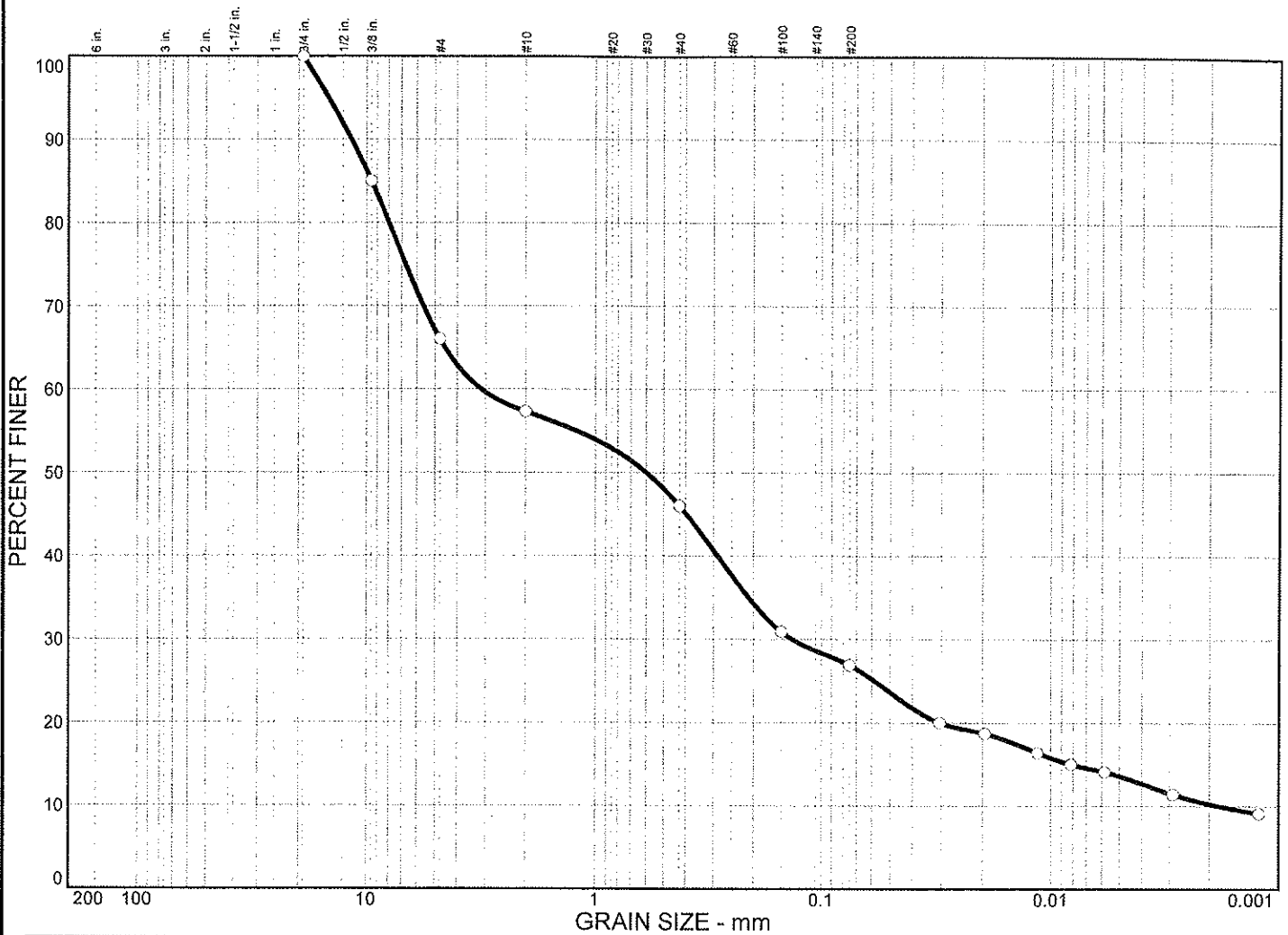
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
23	13	0.251	0.0873	0.0525	0.0033				

MATERIAL DESCRIPTION	USCS	AASHTO
Light Gray, Silty CLAY and SAND	CL	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line		Remarks: ○ Natural Moisture : 12.5% PI : 10
○ Source: CP-3 Sample No.: S-53 Elev./Depth: 122.0'-124.0'		
Particle Size Distribution Report E2CR, Inc.		

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	34.0	39.1	13.3	13.6

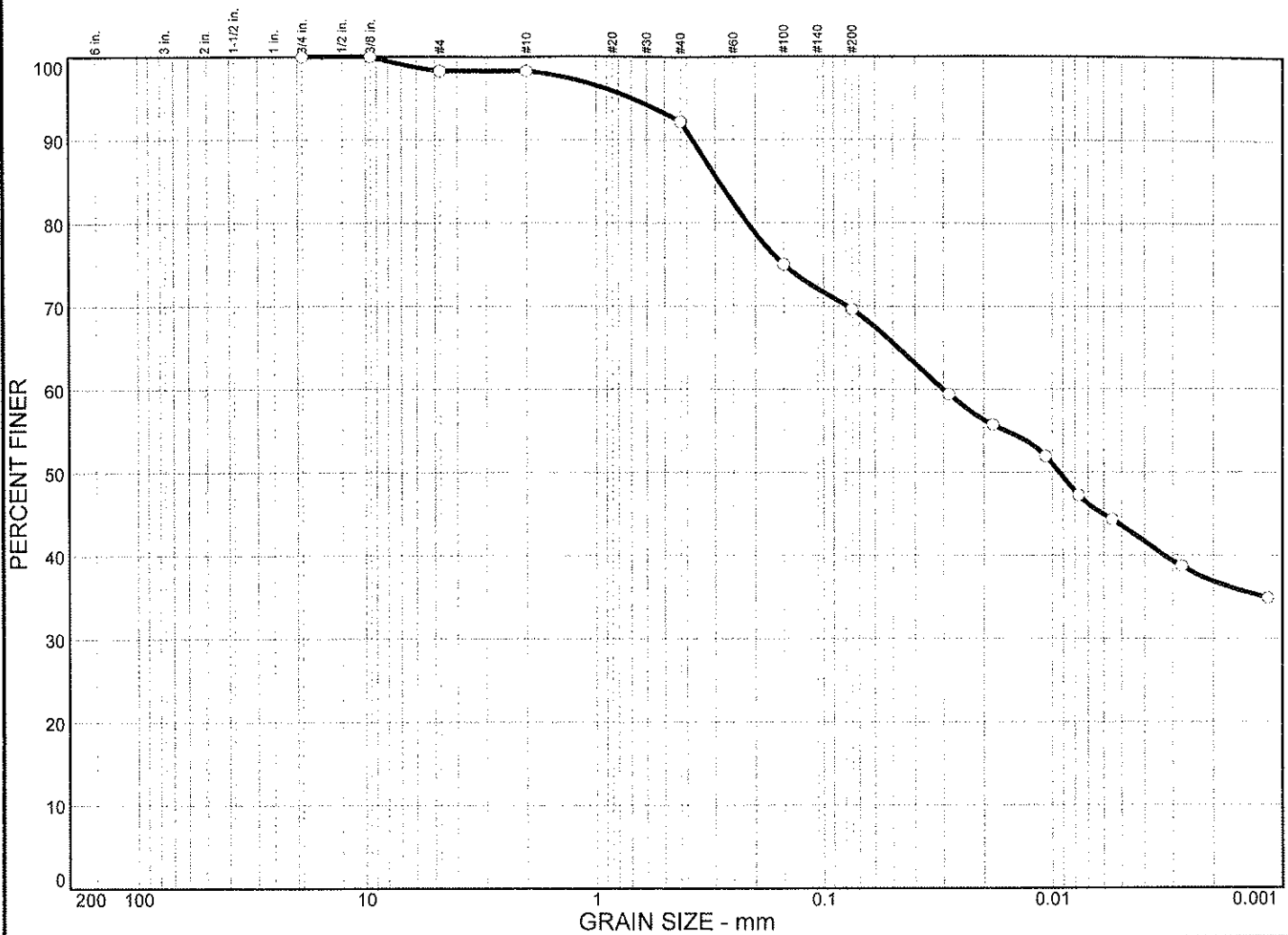
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
32	16	9.52	3.14	0.598	0.134	0.0082	0.0018	3.15	1715.53

MATERIAL DESCRIPTION	USCS	AASHTO
○ Light to Medium Brown, Clayey SAND, some Gravel, little Silt	SC	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-4 Sample No.: S-2 Elev./Depth: 8.0'-10.0'	Remarks: ○ Natural Moisture : 7.7% PI : 16
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	1.7	28.7	26.0	43.6

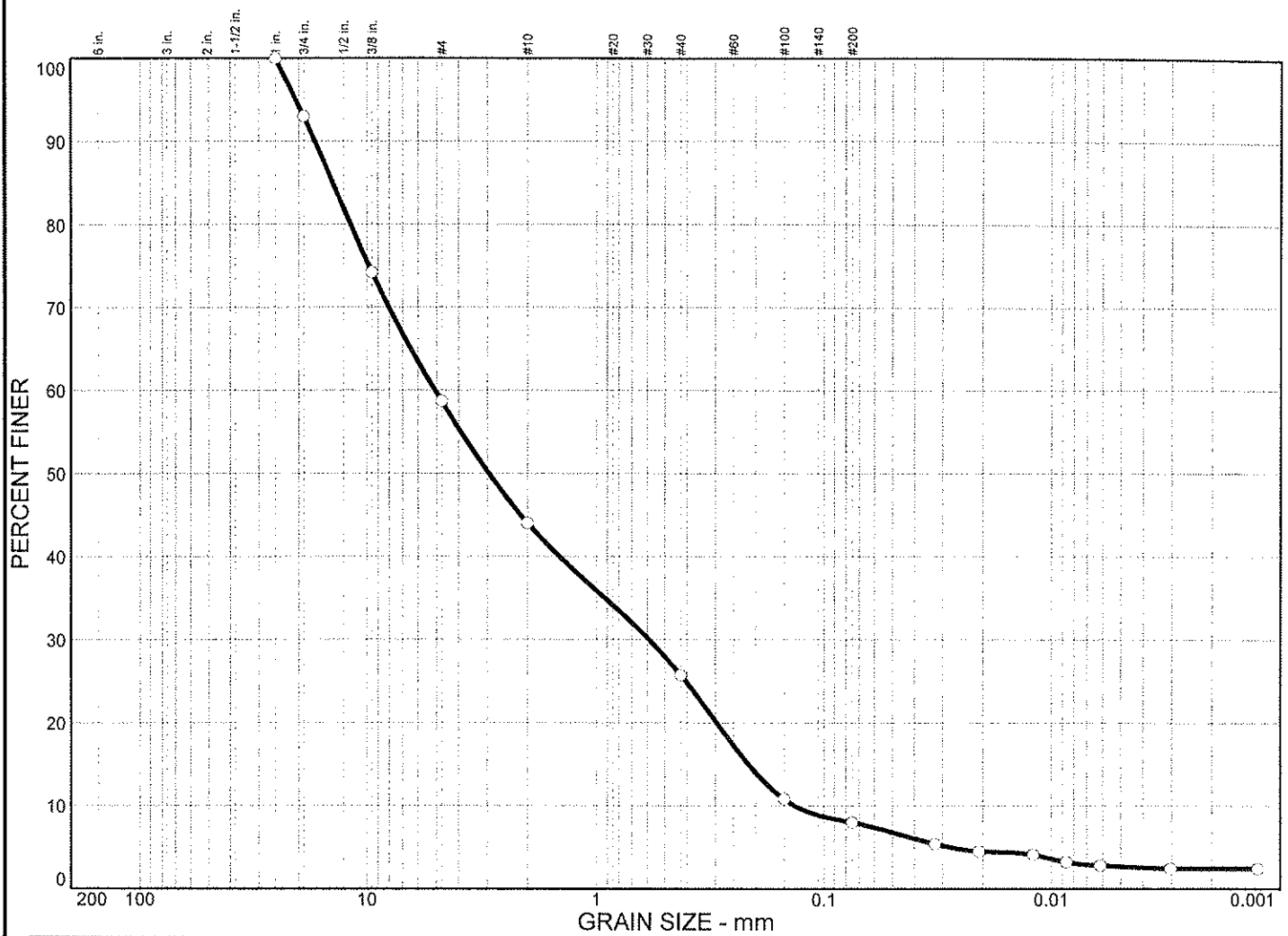
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
50	24	0.289	0.0301	0.0093					

MATERIAL DESCRIPTION	USCS	AASHTO
Orange Brown and Gray, Silty CLAY, some Sand	CH	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-4 Sample No.: S-6 Elev./Depth: 16.0'-18.0'	Remarks: Natural Moisture : 19.7% PI : 26
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	41.3	50.7	5.3	2.7

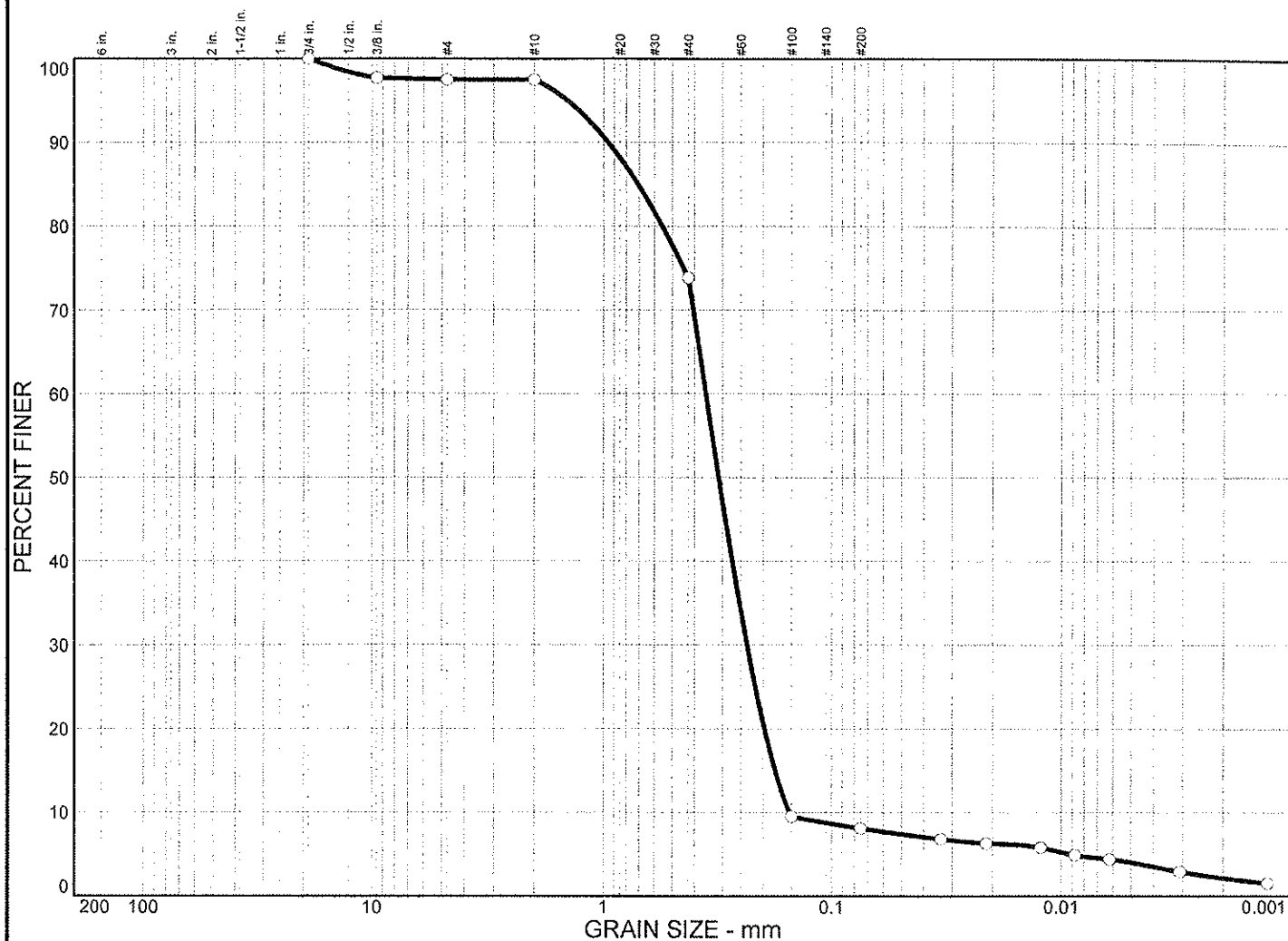
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
NP	NP	14.2	5.07	2.96	0.588	0.214	0.135	0.51	37.62

MATERIAL DESCRIPTION	USCS	AASHTO
Tan and Light Brown, SAND and Gravel, trace Silt	SP-SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-4 Sample No.: S-9 Elev./Depth: 22.0'-24.0'	Remarks: Natural Moisture : 2.2%
Particle Size Distribution Report E2CR, Inc.	

Figure

Particle Size Distribution Report

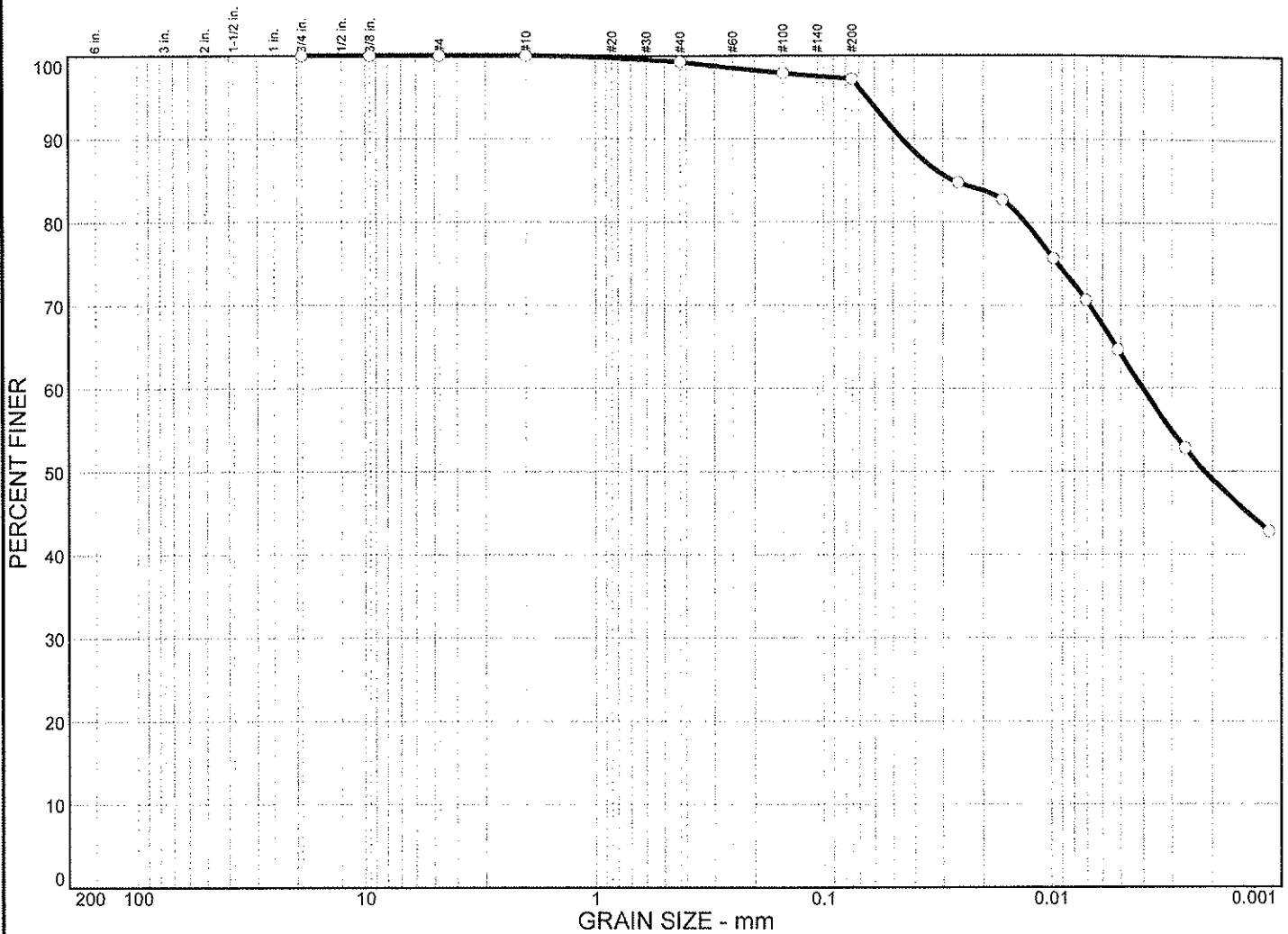


% COBBLES		% GRAVEL		% SAND				% SILT		% CLAY	
0.0		2.5		89.4				4.1		4.0	
LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u		
NP	NP	0.709	0.356	0.312	0.234	0.177	0.153	1.01	2.33		

MATERIAL DESCRIPTION								USCS	AASHTO
○ Light Tan, Silty SAND								SP-SM	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-4 Sample No.: S-14 Elev./Depth: 32.0'-34.0'	Remarks: ○ Natural Moisture : 18.5%
Particle Size Distribution Report E2CR, Inc.	
Figure	

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	2.8	33.0	64.2

LL	PL	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
49	21	0.0273	0.0040	0.0022					

MATERIAL DESCRIPTION	USCS	AASHTO
Purple, Silty CLAY	CL	

Project No. 07503-04 Client: Mayland Transit Administration Project: Purple Line Source: CP-4 Sample No.: S-18 Elev./Depth: 40.0'-42.0'	Remarks: Natural Moisture : 19.4% PI : 28
Particle Size Distribution Report E2CR, Inc.	

Figure



CHEMICAL TEST RESULTS



THE ROBERT B. BALTER COMPANY®

CLIENT: E2CR**PROJECT:** PURPLE LINE**PROJECT LOCATION:** COLLEGE PARK**PROJECT NO.:** 14961-0 MD**CHEMICAL TEST RESULTS ON SOIL**

Boring Number	Sample Number	Sample Depth (ft.)	pH	Chlorides (mg/Kg) PQL=60 SM4500CI-D	Sulfides (mg/Kg) PQL=2 ASTM D 1580	Sulfates (%) PQL=0.02 SM4500S2-C+E	Remarks
CP-2	S-11	32'-34'	4.91	<60	<2	<0.02	
CP-2	S-21	52'-54'	4.02	<60	<2	<0.02	
CP-3	S-19	54'-56'	4.65	<60	<2	<0.02	
CP-3	S-30	76'-78'	4.60	<60	<2	<0.02	

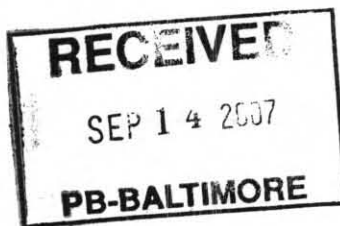


PENNIMAN & BROWNE, INC.

CHEMISTS / ENGINEERS / INSPECTORS
INDUSTRIAL HYGIENE SERVICES
FOUNDED 1896

Prepared for:

James Parkes/Tahir Qureshi
Robert B. Balter Company
100 S. Charles Street, Tower One, 10th Floor
Baltimore, MD 21201



Certificate of Analysis

8/28/2007

Purple Line-College Park-Section MTA

Sample Information

Sample Number 70002419-01
Sample ID CP-2 S-11 32.0-34.0'
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 08/01/07 14:00
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	08/06/2007 10:15	SM 4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	08/23/2007 10:30	ASTM D1580
Sulfide	mg/Kg	2	<2	KS	08/03/2007 11:00	SM4500S2-C+E

Sample Information

Sample Number 70002419-02
Sample ID CP-2 S-21 52.0-54.0'
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 08/01/07 14:00
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	08/06/2007 10:15	SM 4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	08/23/2007 10:30	ASTM D1580
Sulfide	mg/Kg	2	<2	KS	08/03/2007 11:00	SM4500S2-C+E

Sample Information

Sample Number 70002419-03
Sample ID CP-3 S-19 54.0-56.0'
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 08/01/07 14:00
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	08/06/2007 10:15	SM 4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	08/23/2007 10:30	ASTM D1580
Sulfide	mg/Kg	2	<2	KS	08/03/2007 11:00	SM4500S2-C+E

This report may be reproduced only in its entirety. The results are valid only for the item(s) tested. They are provided to the client on a confidential basis and, to the extent of the law, will not be released to third parties without authorization.

Prepared for:

James Parkes/Tahir Qureshi
Robert B. Balter Company
100 S. Charles Street, Tower One, 10th Floor
Baltimore, MD 21201

Certificate of Analysis

8/28/2007

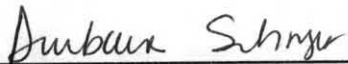
Purple Line-College Park-Section MTA

Sample Information

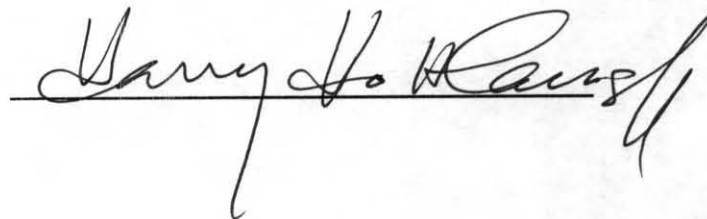
Sample Number 70002419-04
Sample ID CP-3 S-30 76.0-78.0'
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 08/01/07 14:00
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	08/06/2007 10:15	SM 4500Cl-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	08/23/2007 10:30	ASTM D1580
Sulfide	mg/Kg	2	<2	KS	08/03/2007 11:00	SM4500S2-C+E



Barbara Schroyer - Quality Assurance Manager



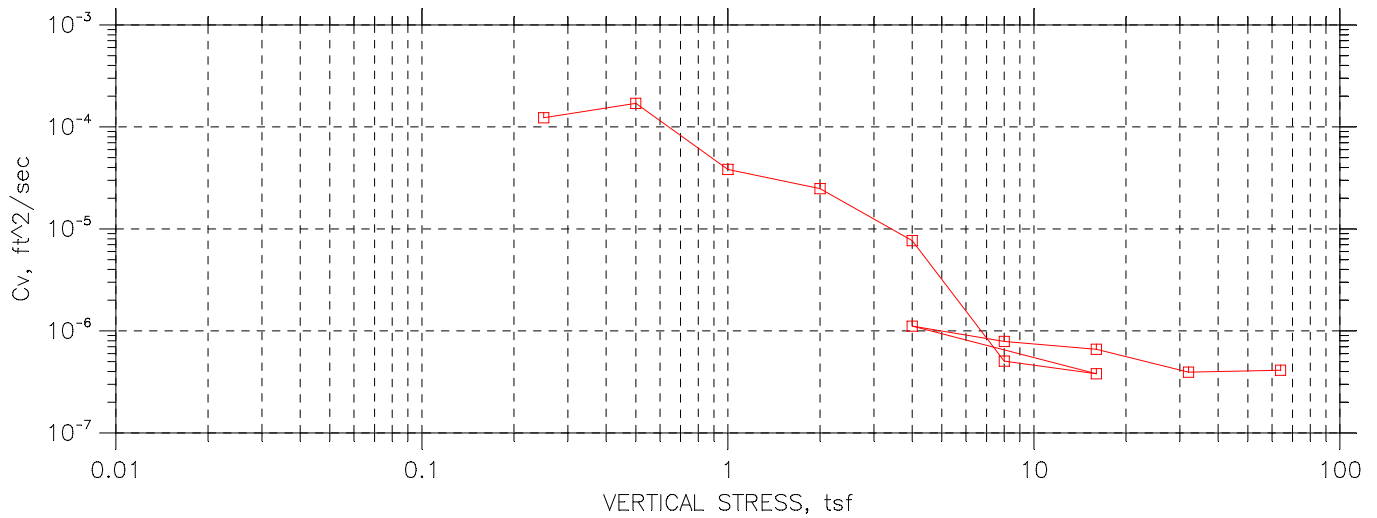
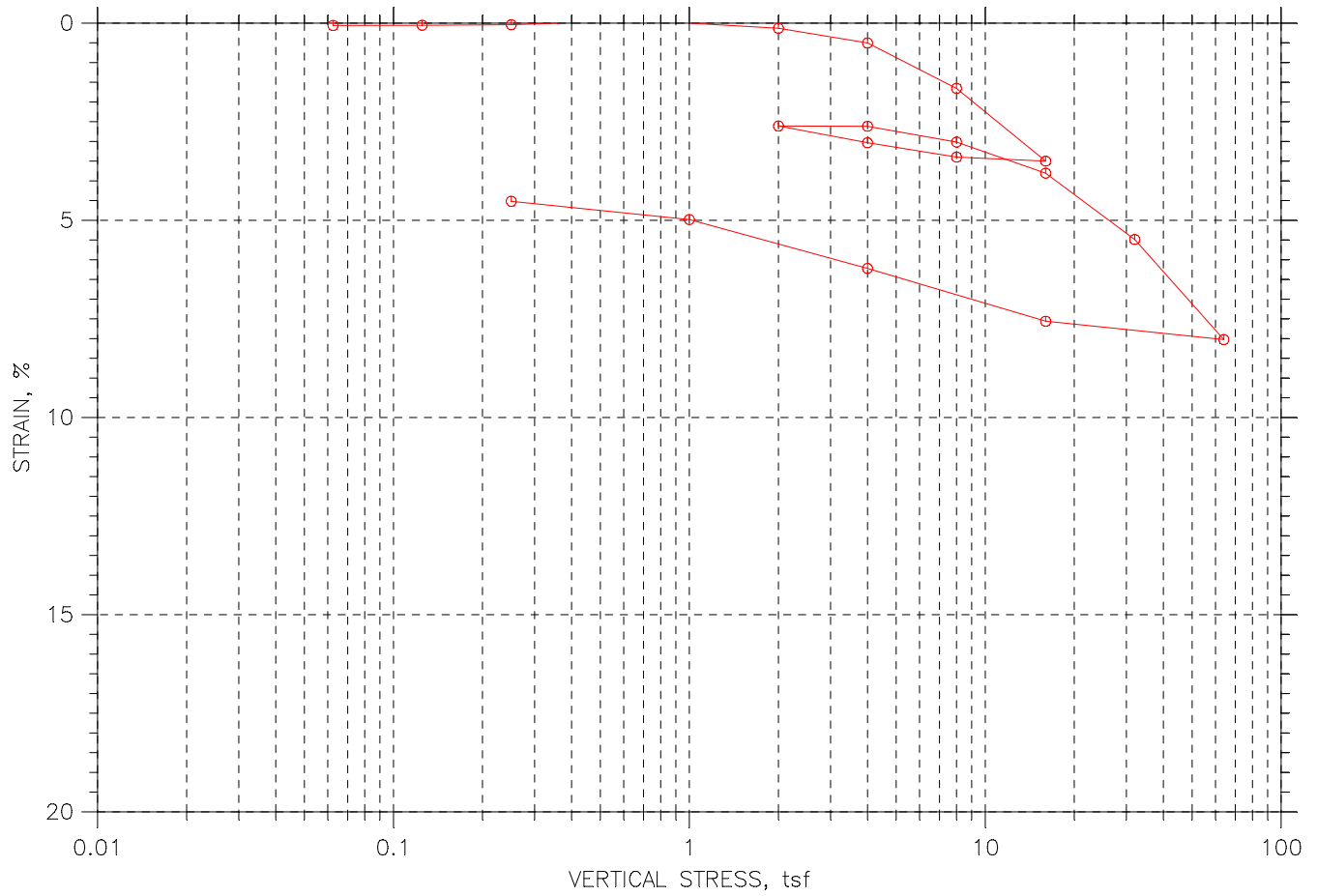
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CONSOLIDATION TEST RESULTS

CONSOLIDATION TEST DATA

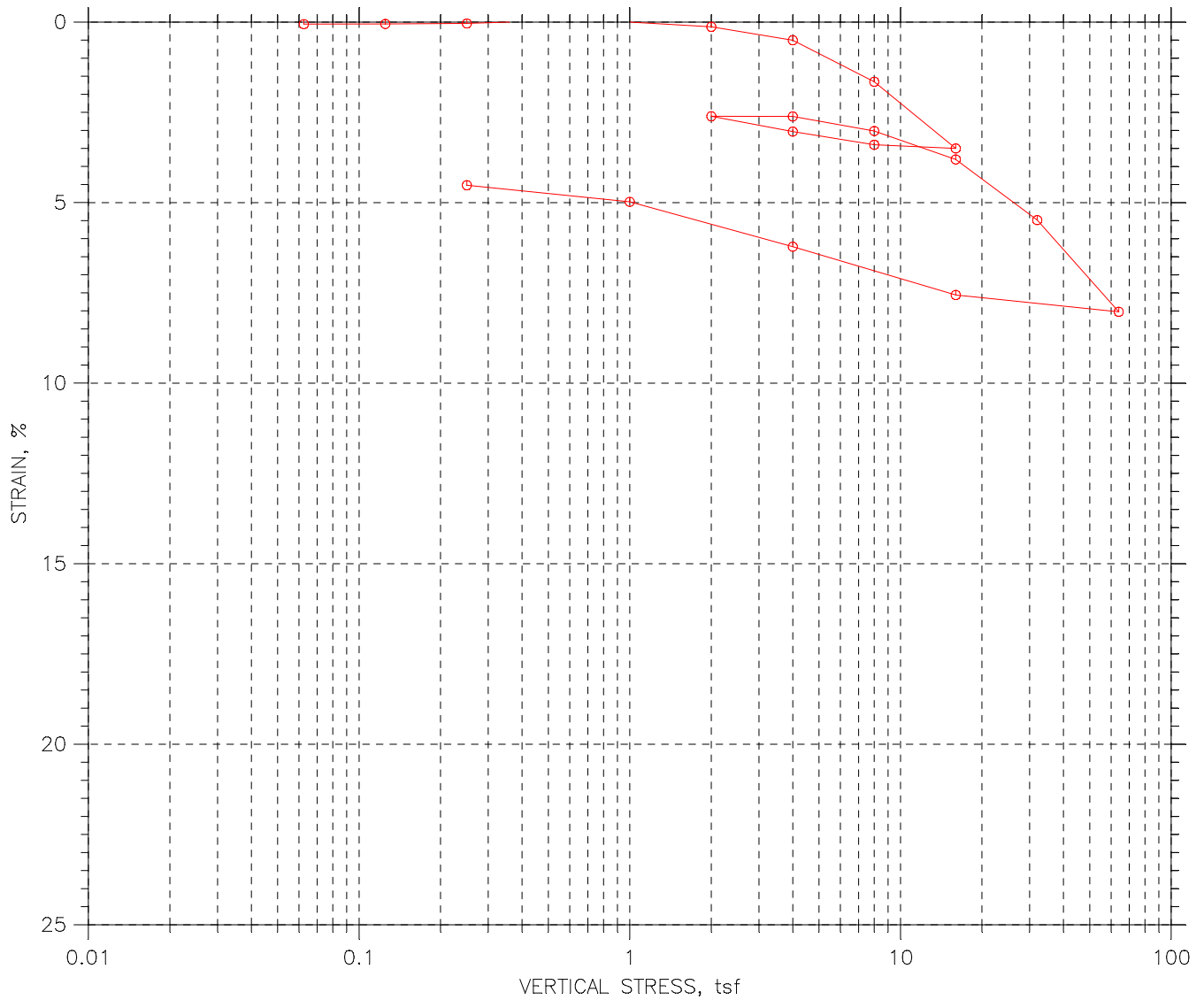
SUMMARY REPORT



	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

SUMMARY REPORT



				Before Test	After Test	
Overburden Pressure: 0 tsf				Water Content, %	30.16	24.67
Preconsolidation Pressure: 0 tsf				Dry Unit Weight, pcf	94.57	99.05
Compression Index: 0				Saturation, %	104.11	94.92
Diameter: 1.987 in		Height: 1 in		Void Ratio	0.78	0.70
LL: 63	PL: 27	PI: 36	GS: 2.70			

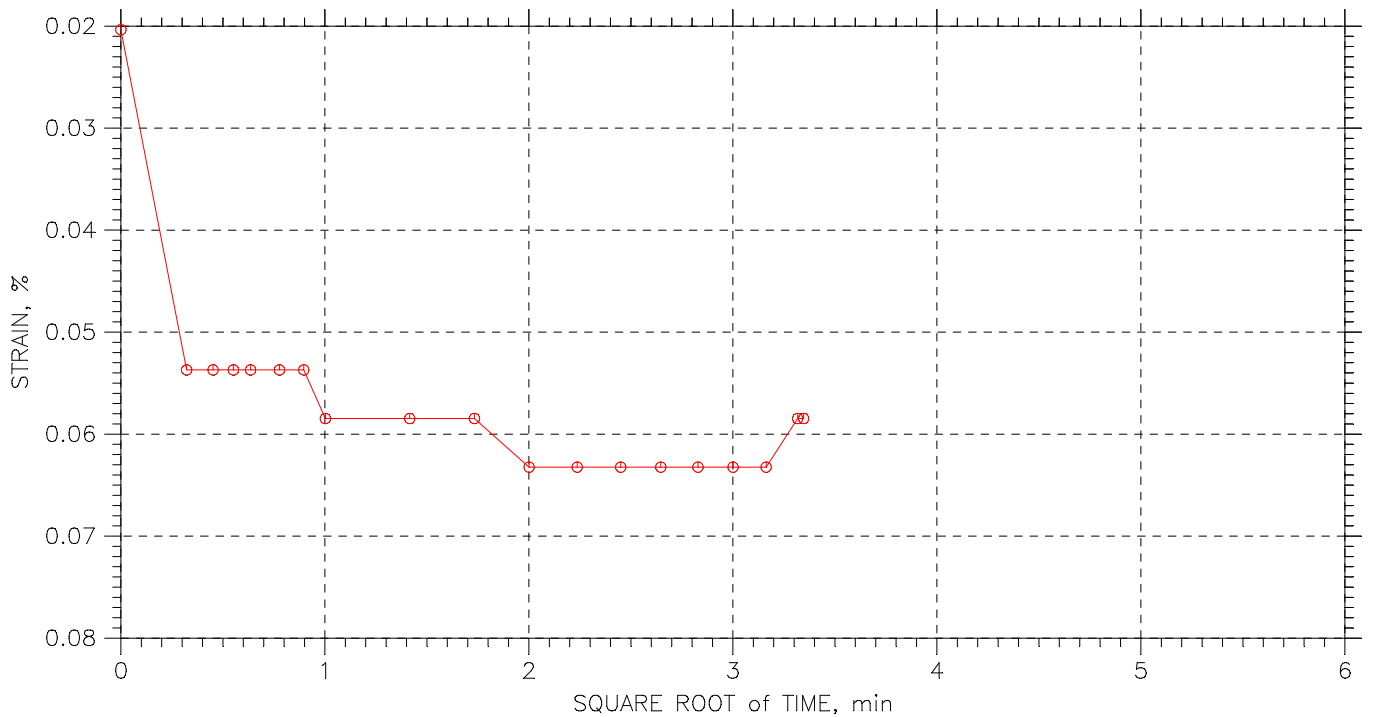
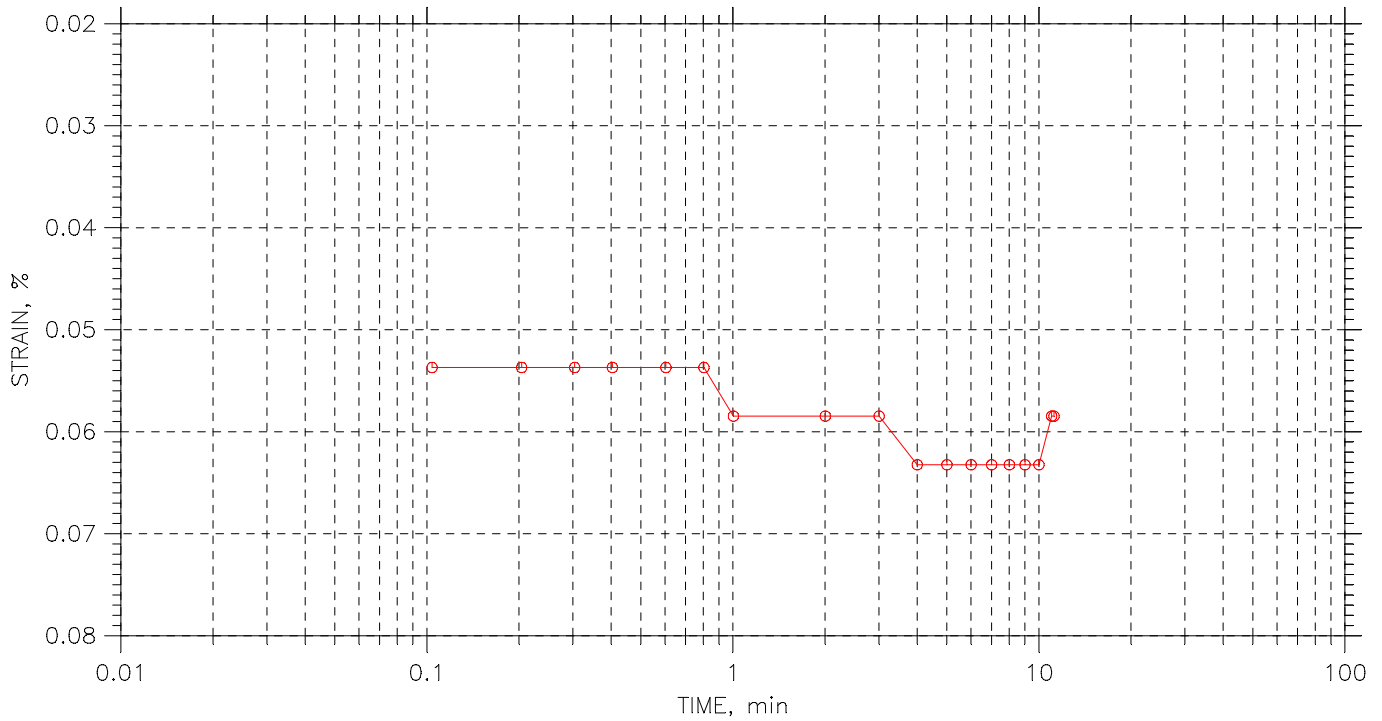
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 21

Stress: 6.25e-002 tsf



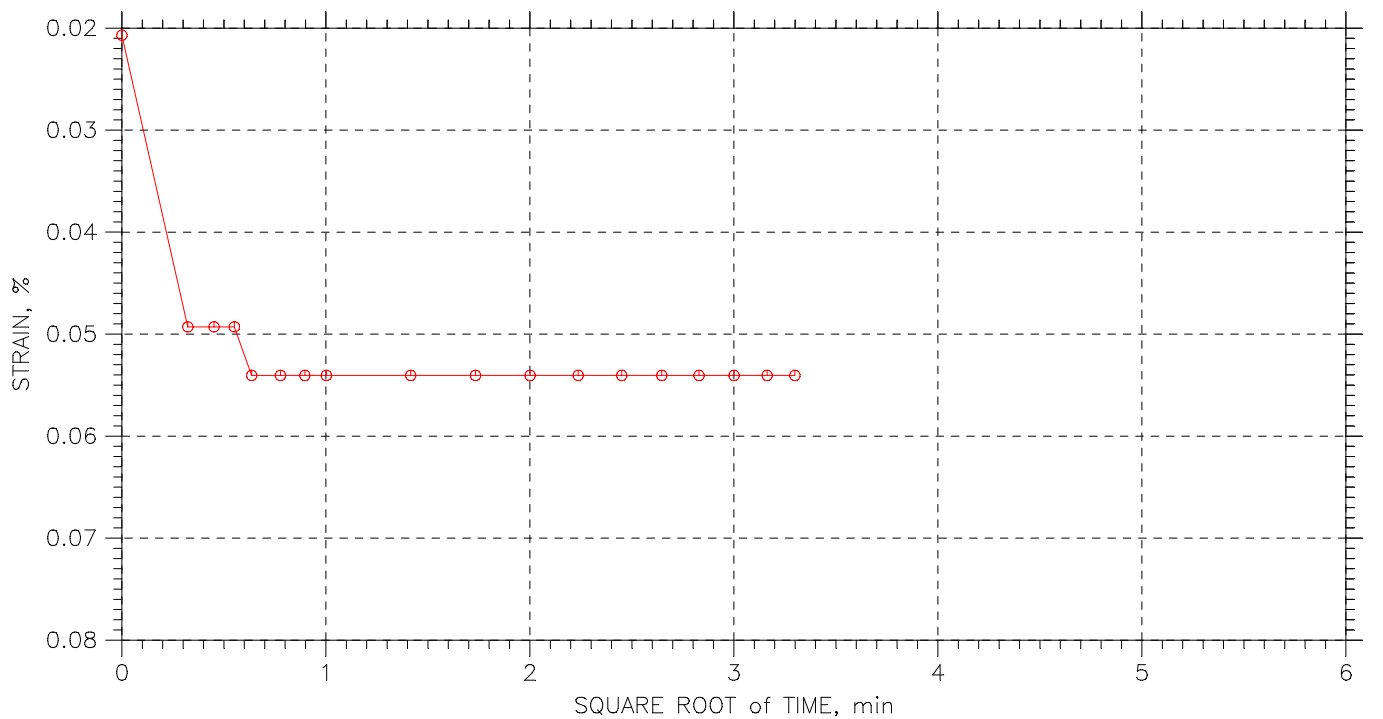
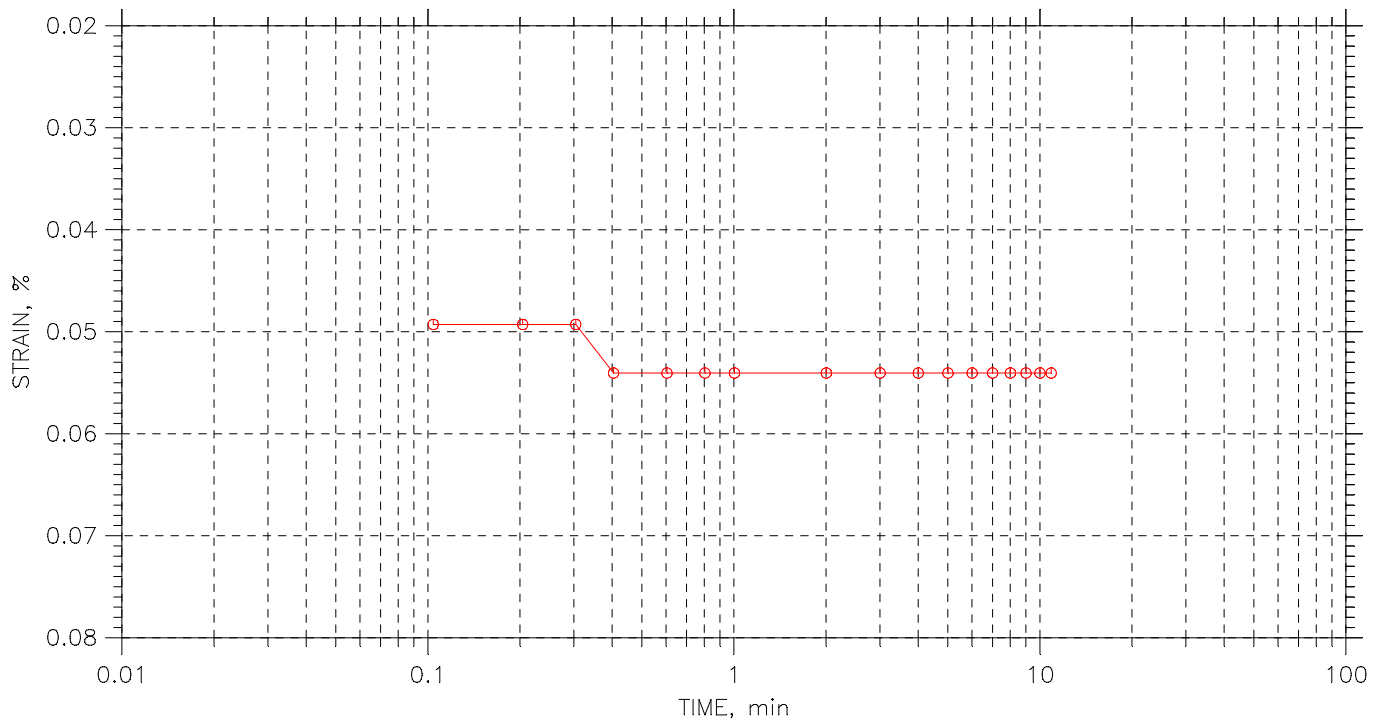
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 21

Stress: 0.125 tsf



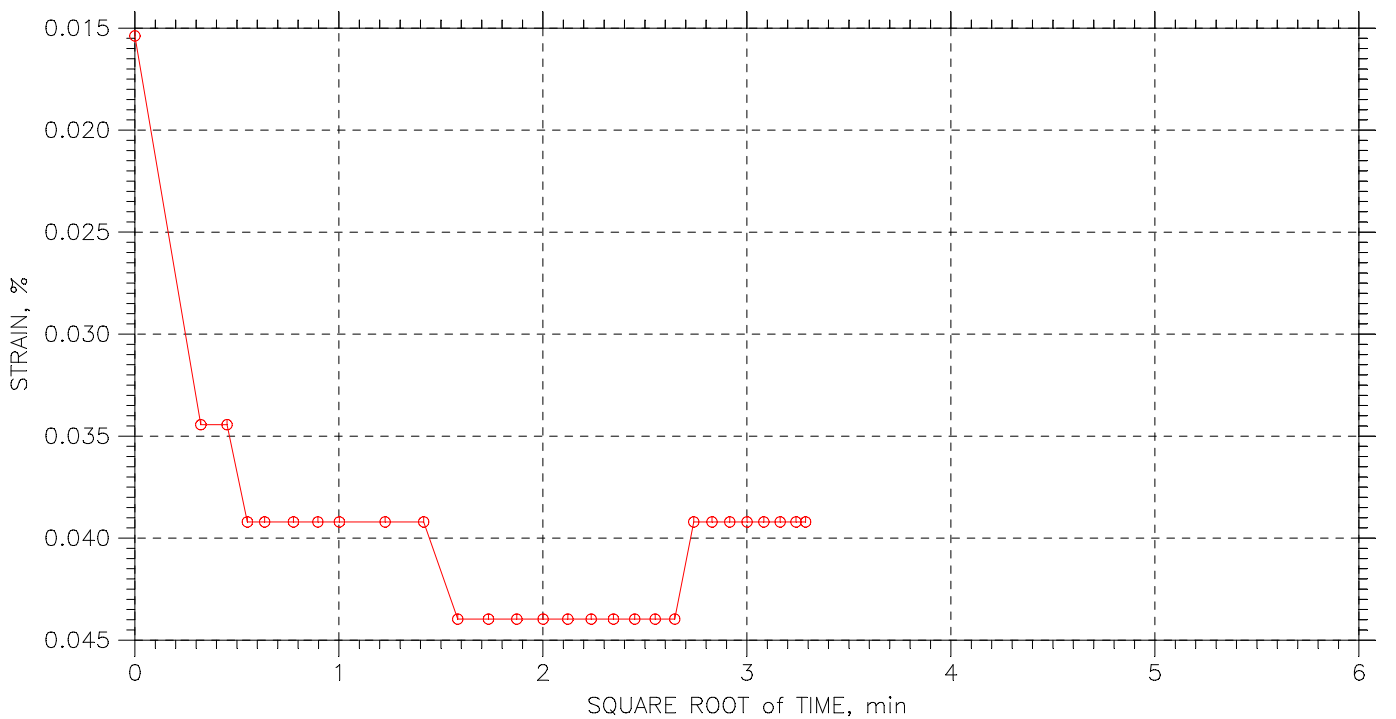
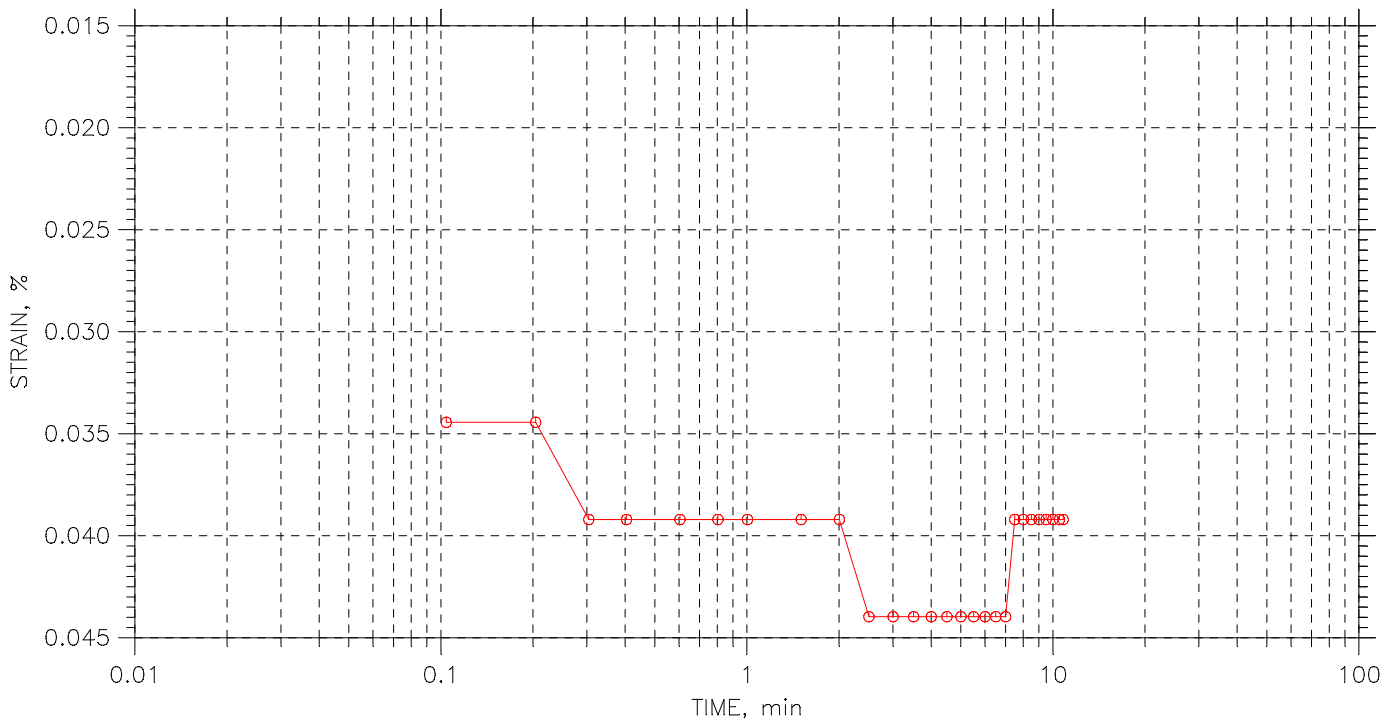
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 21

Stress: 0.25 tsf



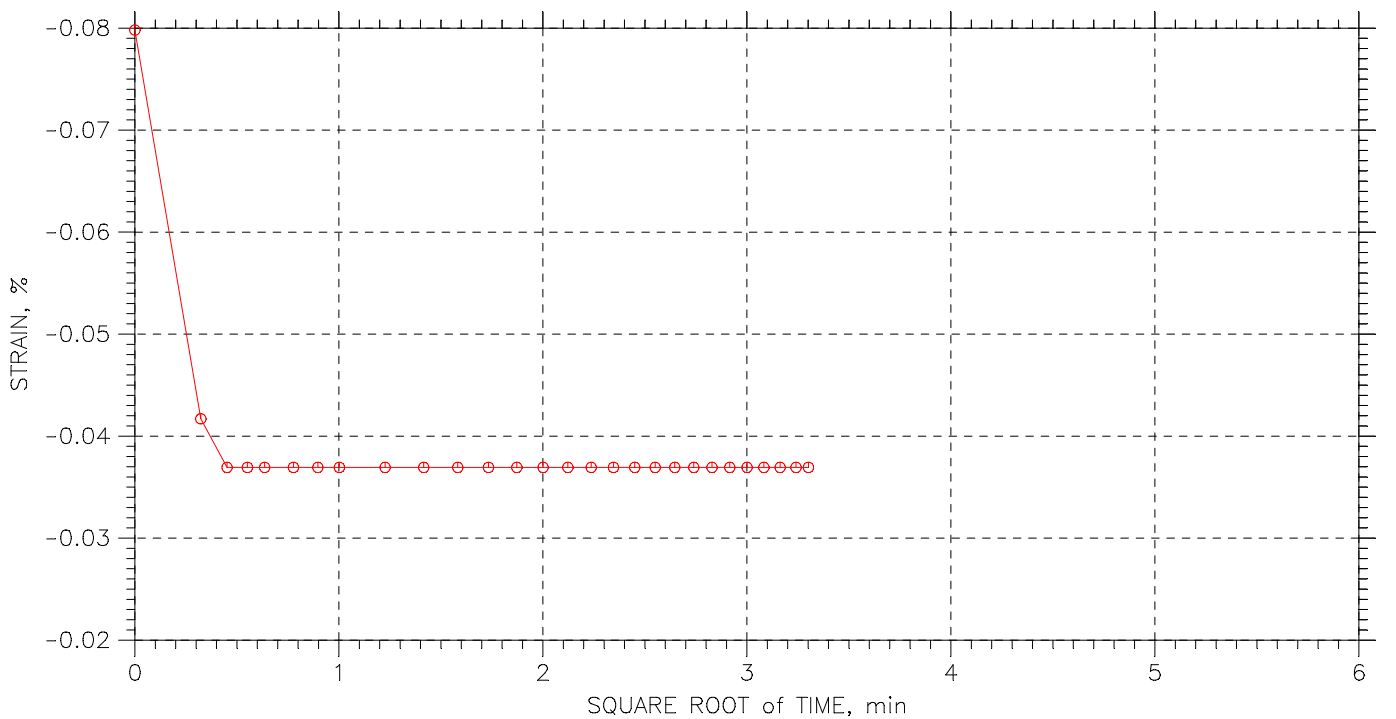
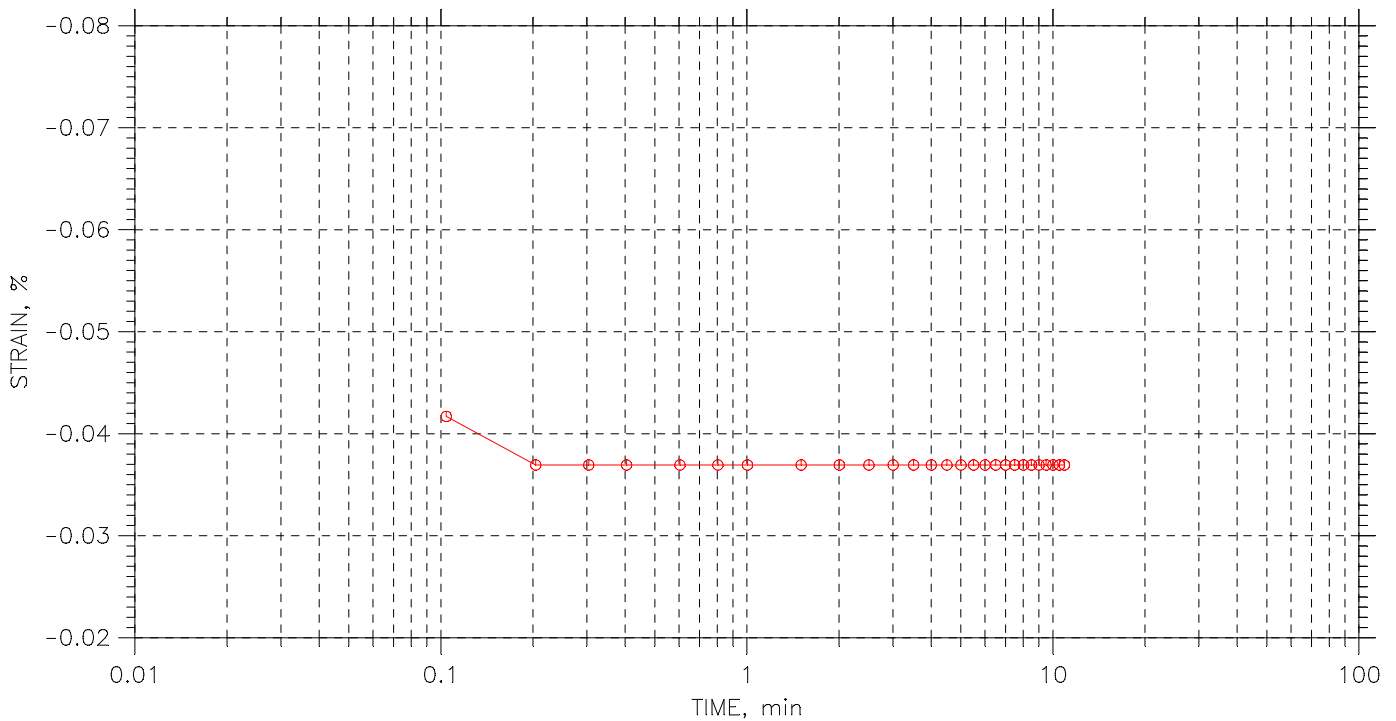
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 21

Stress: 0.5 tsf



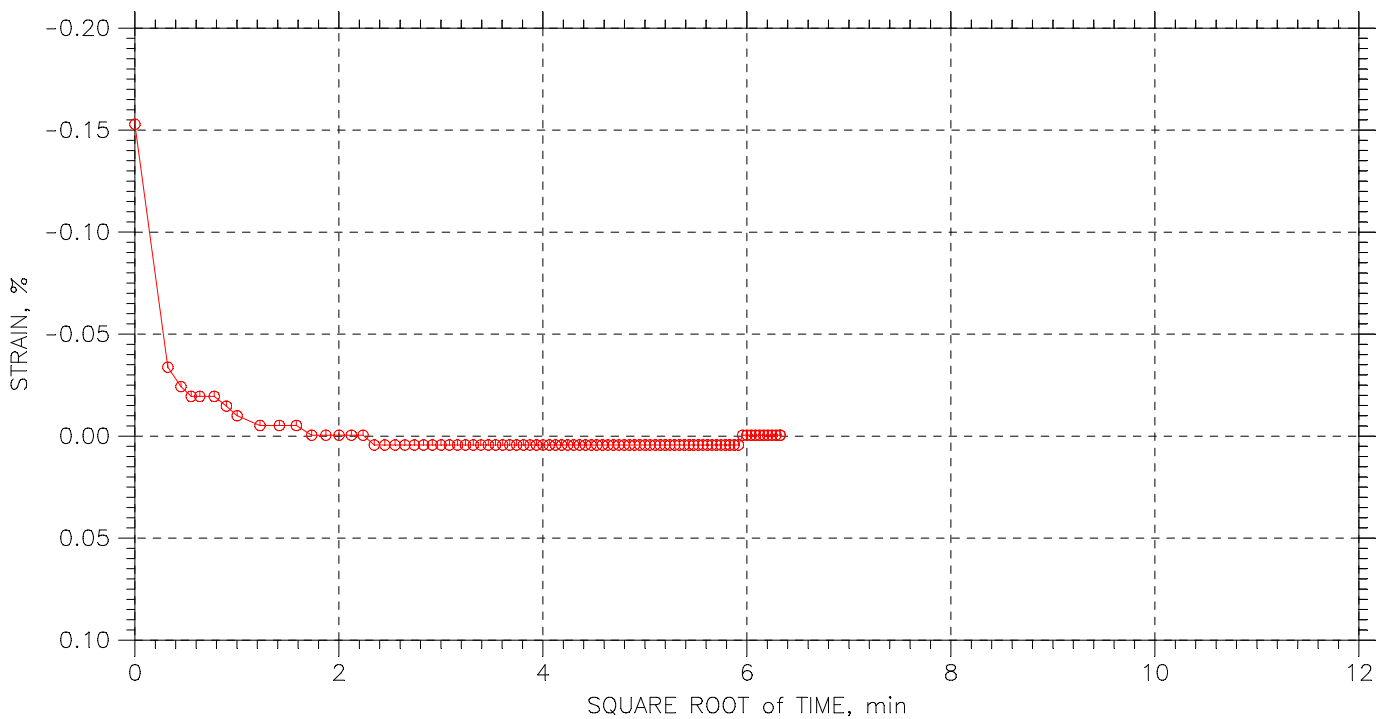
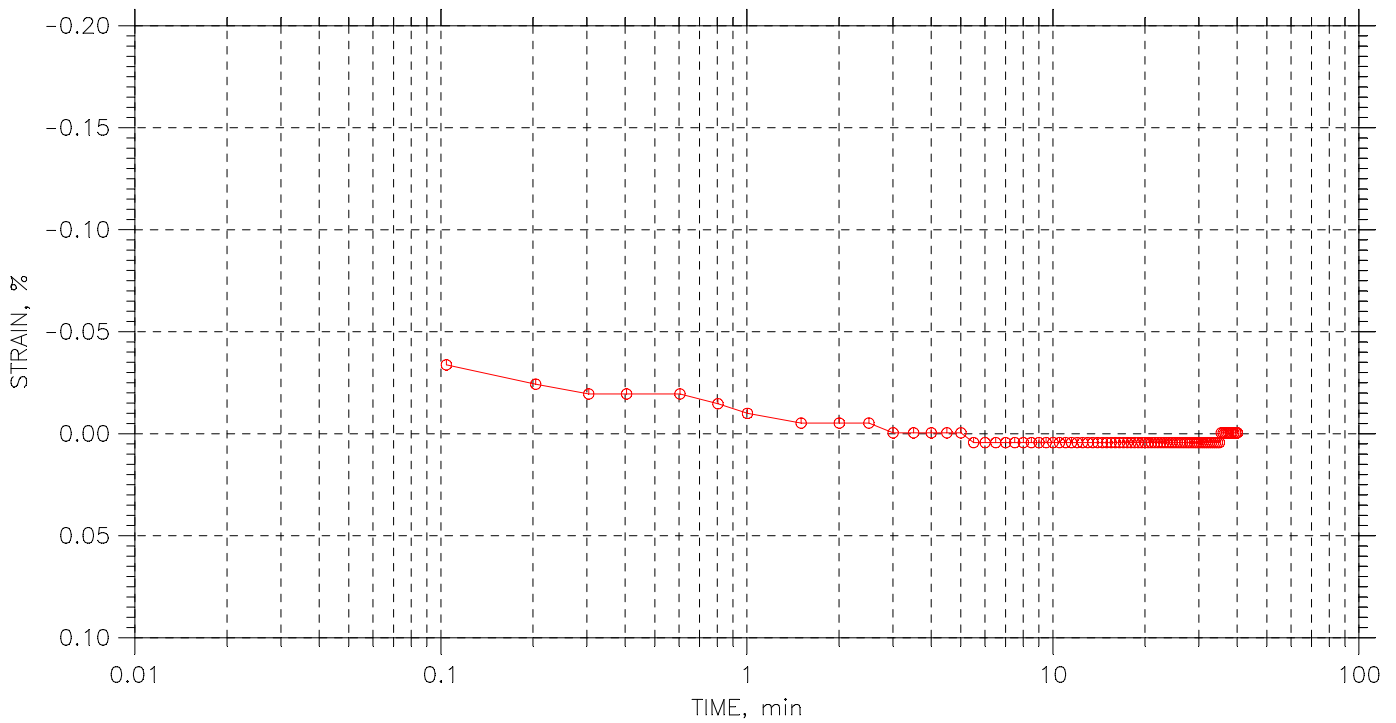
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 21

Stress: 1. tsf



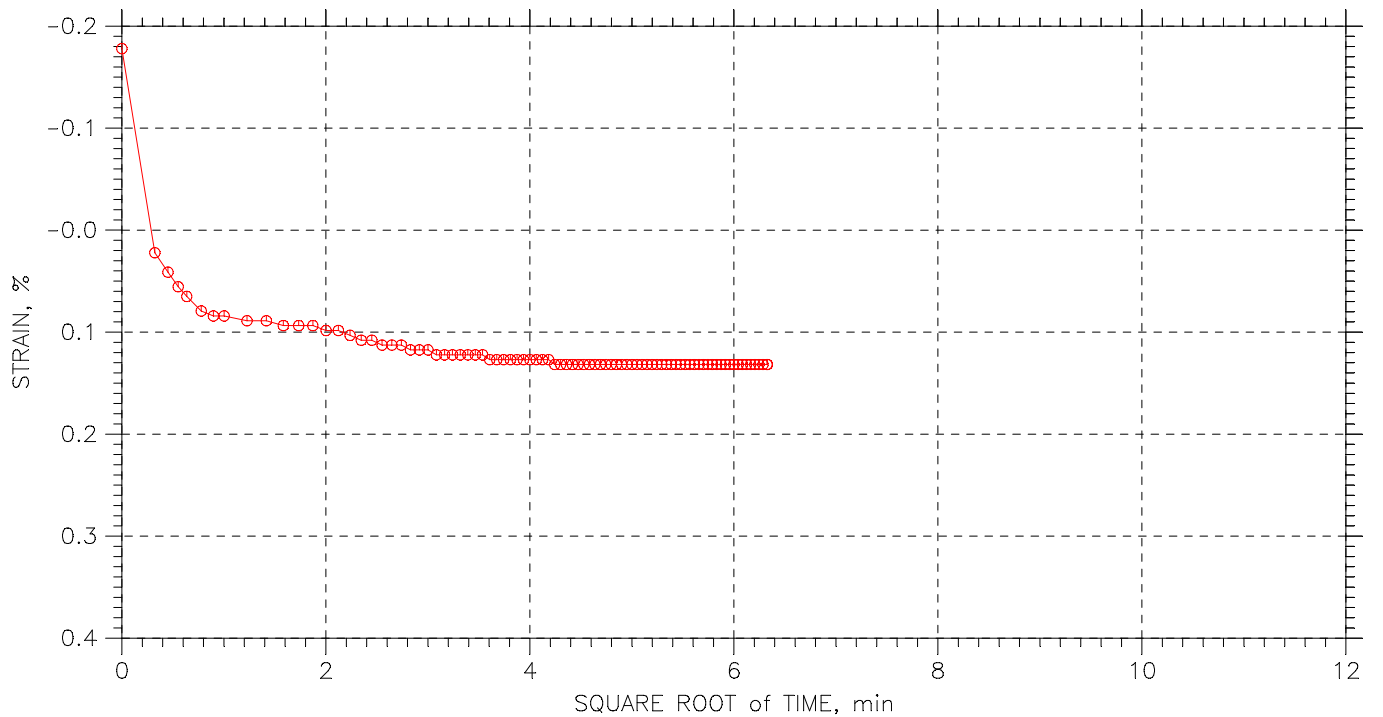
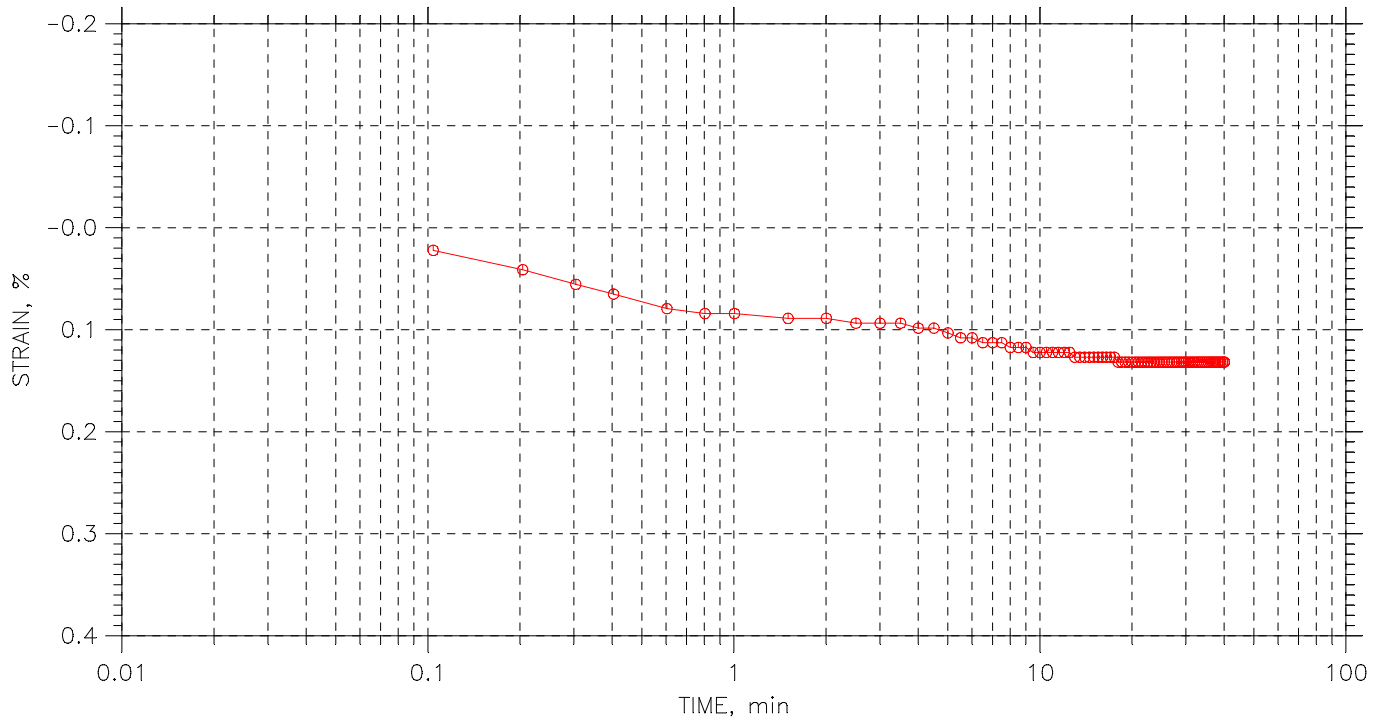
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 21

Stress: 2. tsf



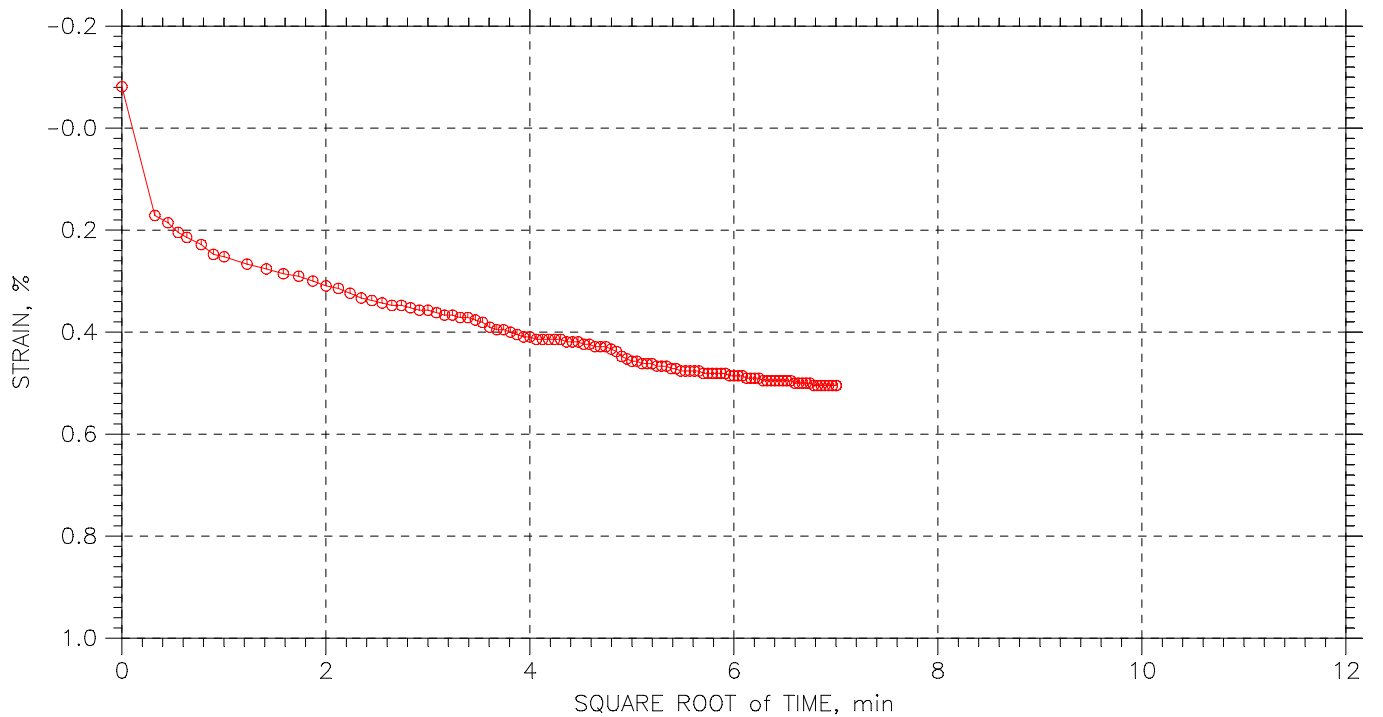
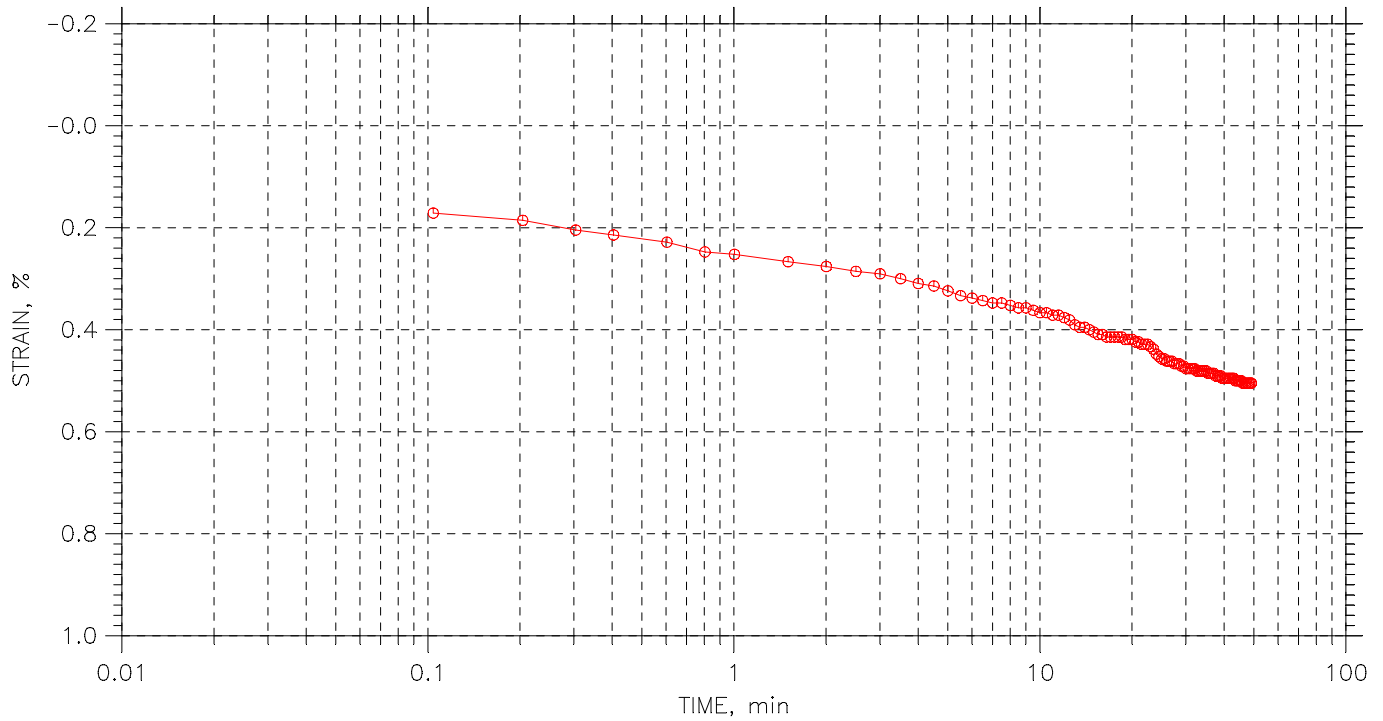
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 21

Stress: 4. tsf



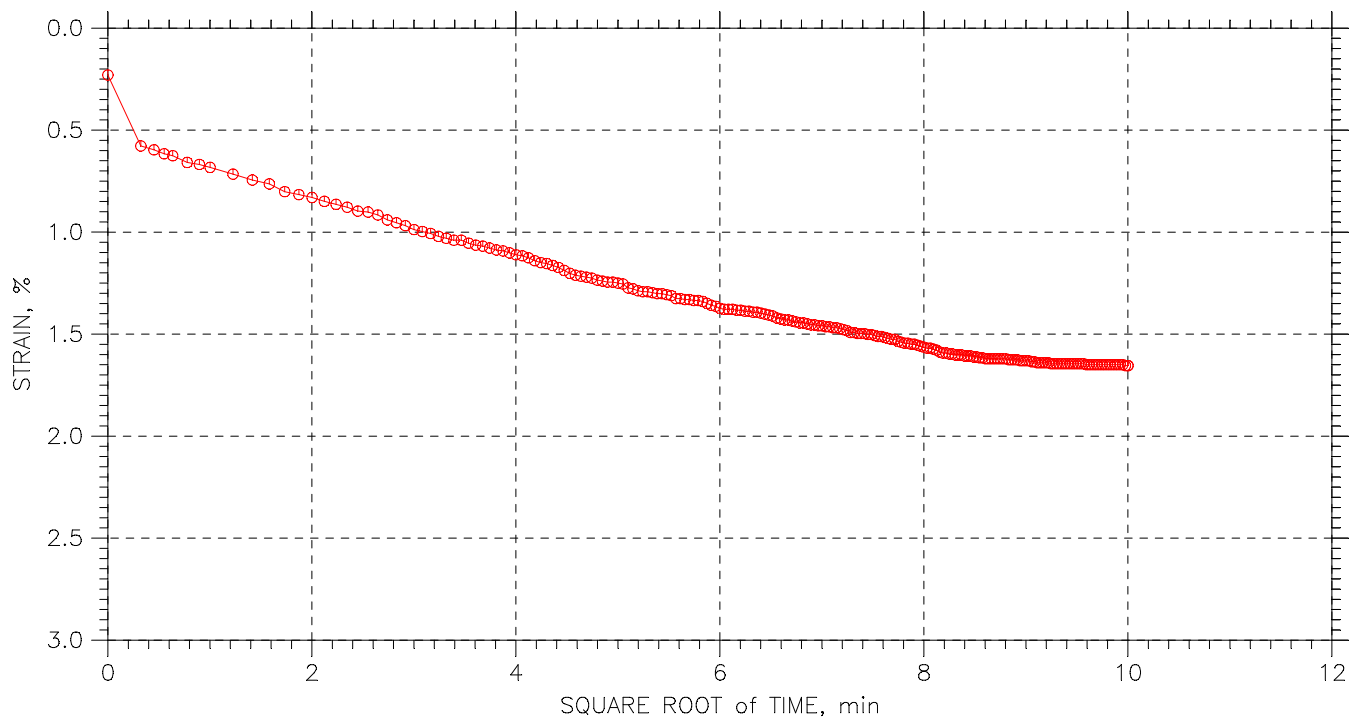
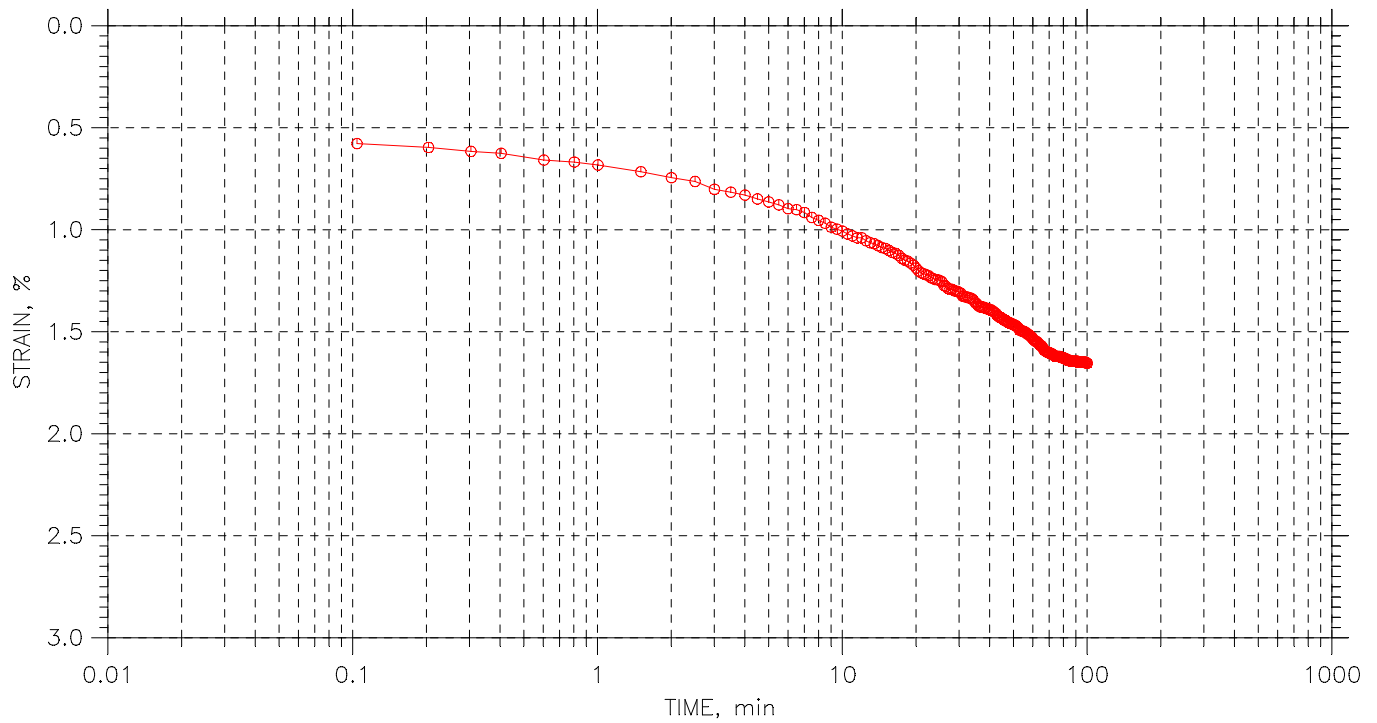
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 21

Stress: 8. tsf



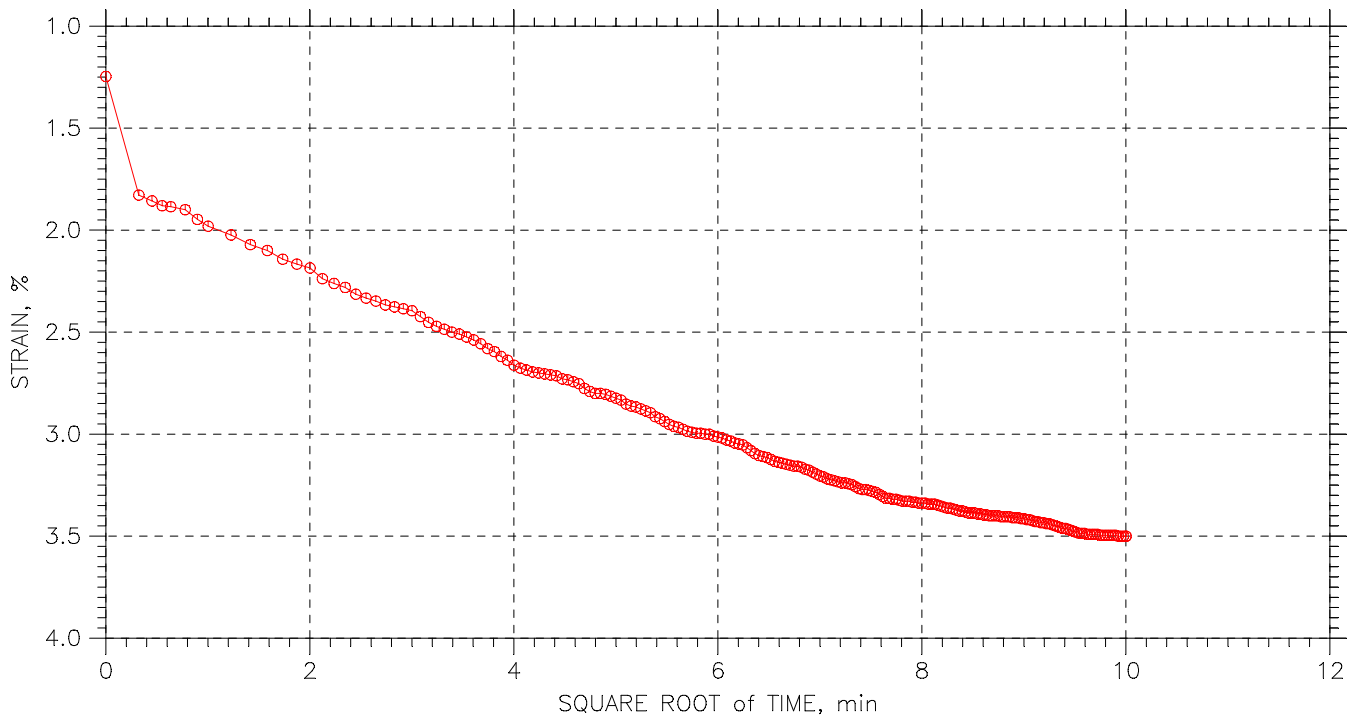
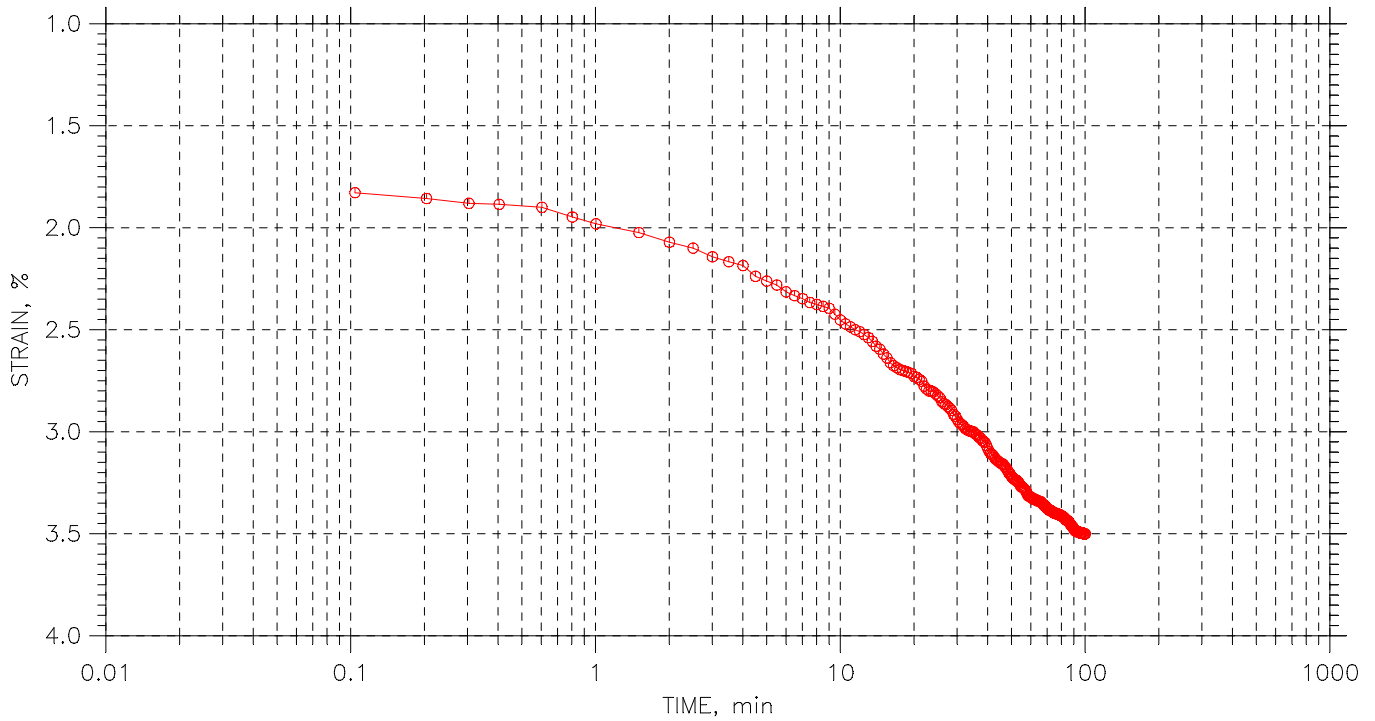
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 21

Stress: 16. tsf



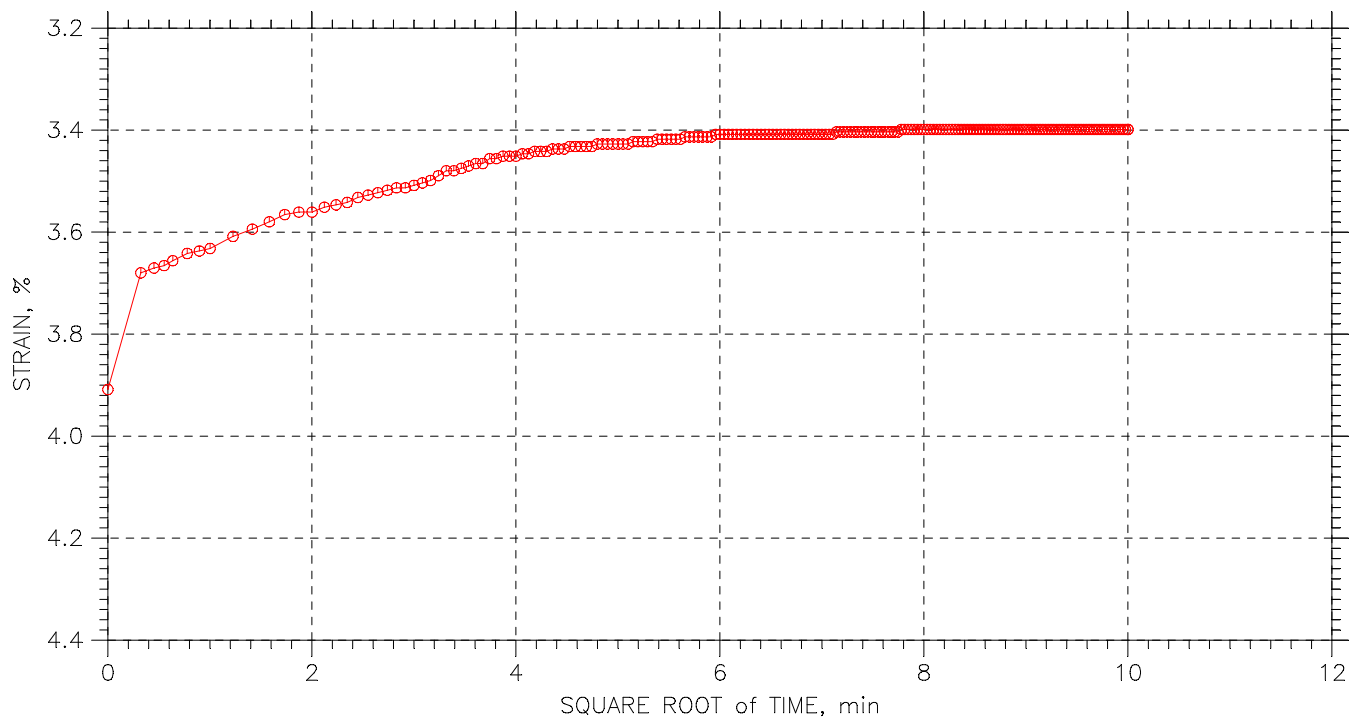
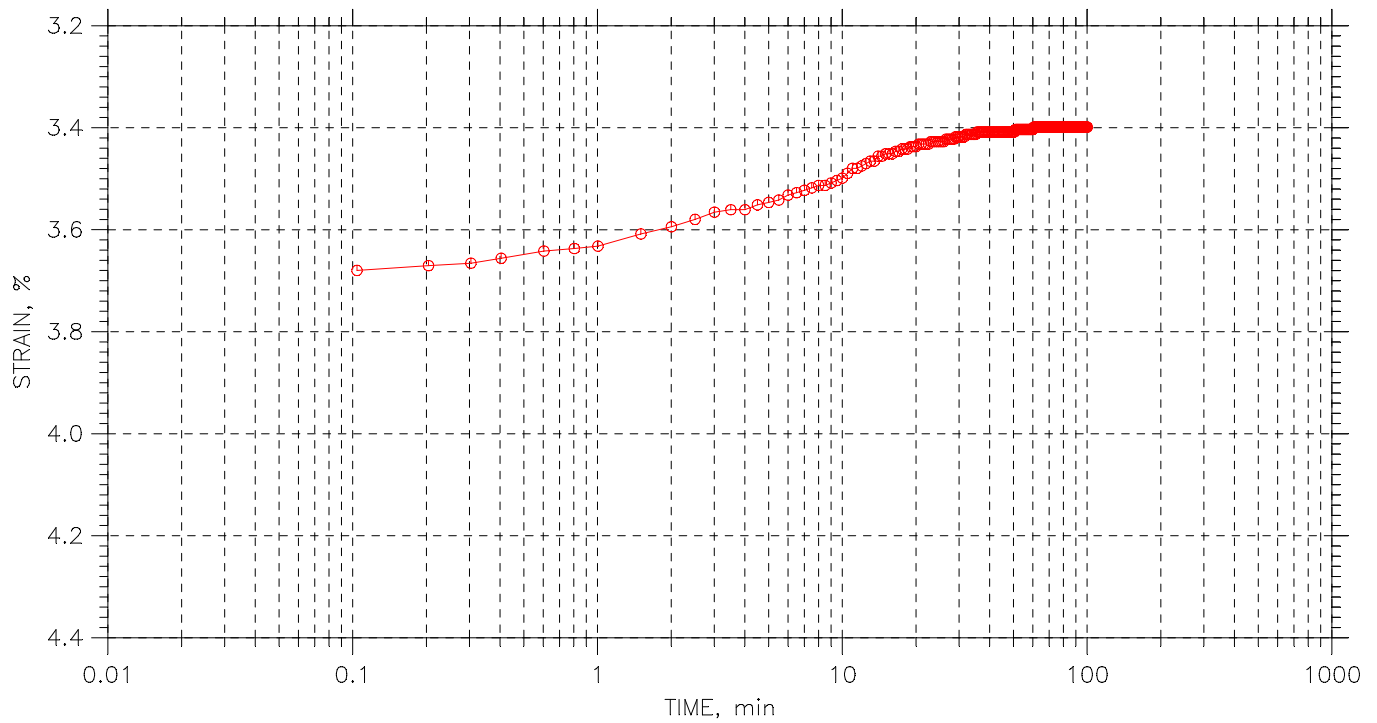
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 21

Stress: 8. tsf



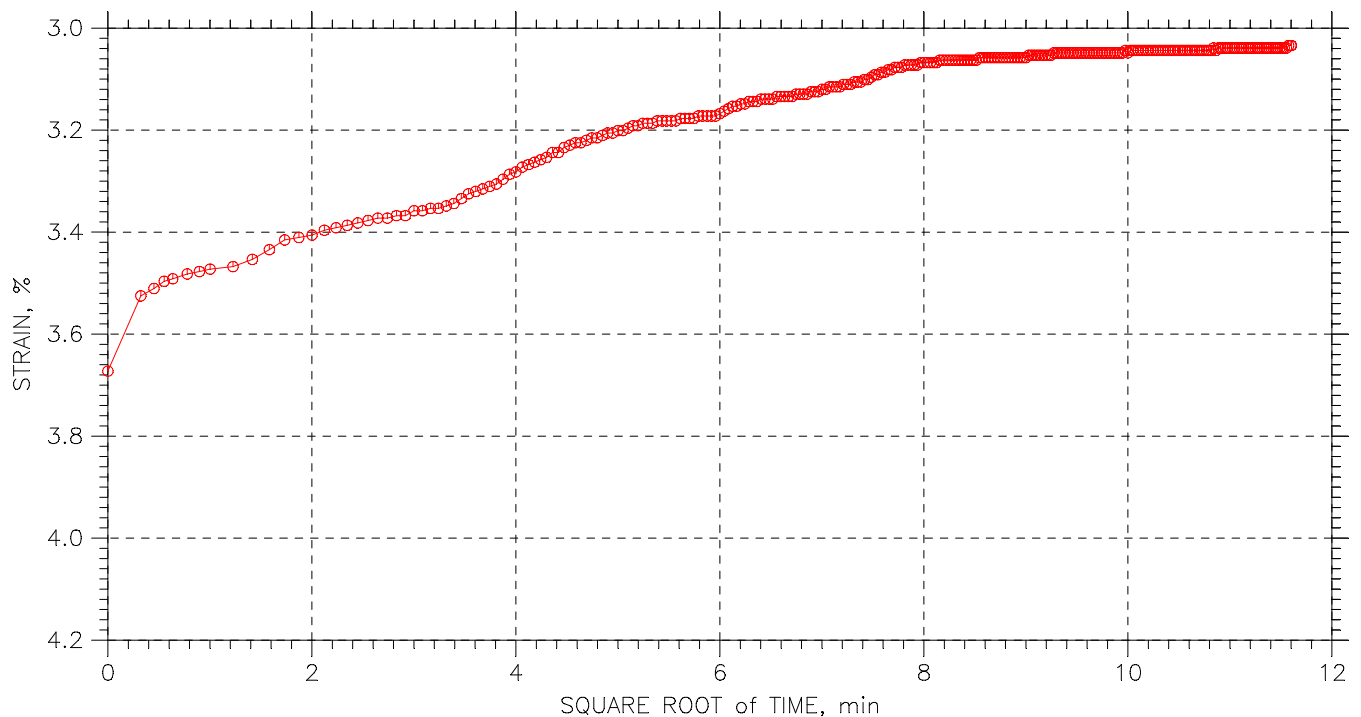
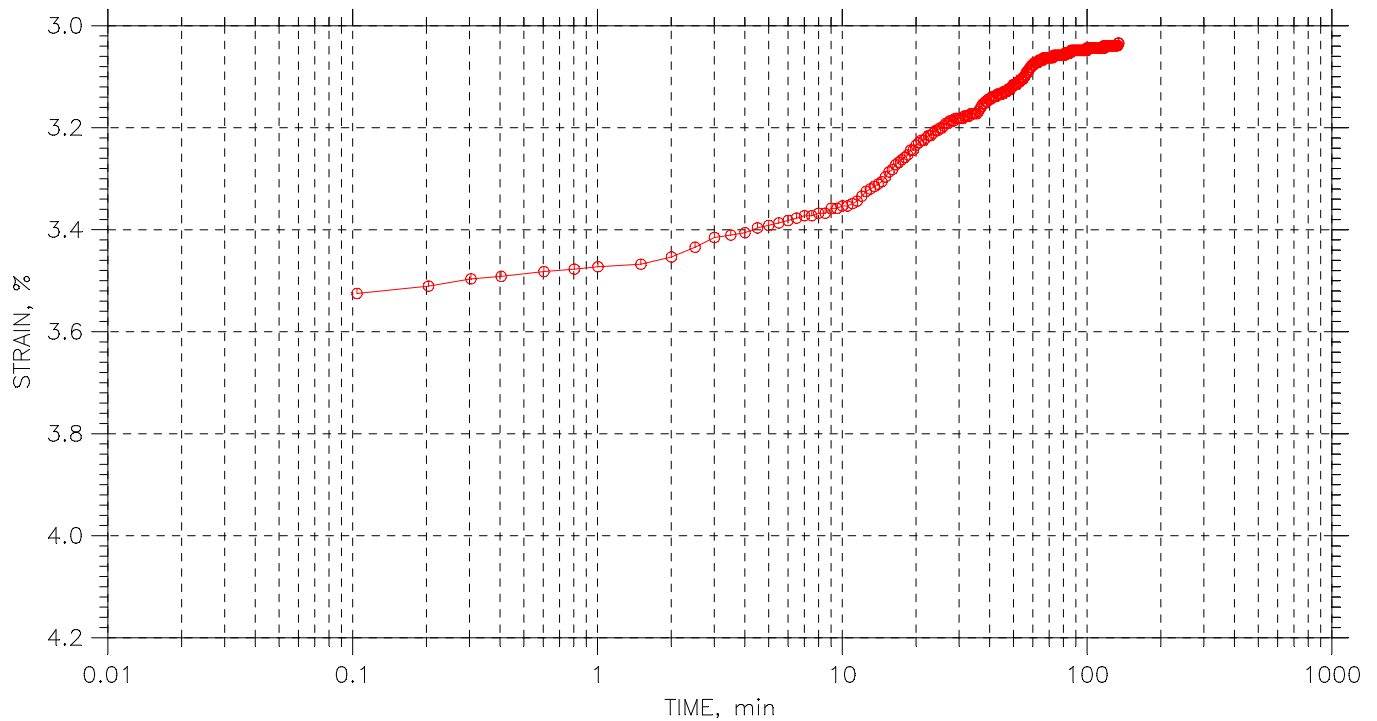
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 21

Stress: 4. tsf



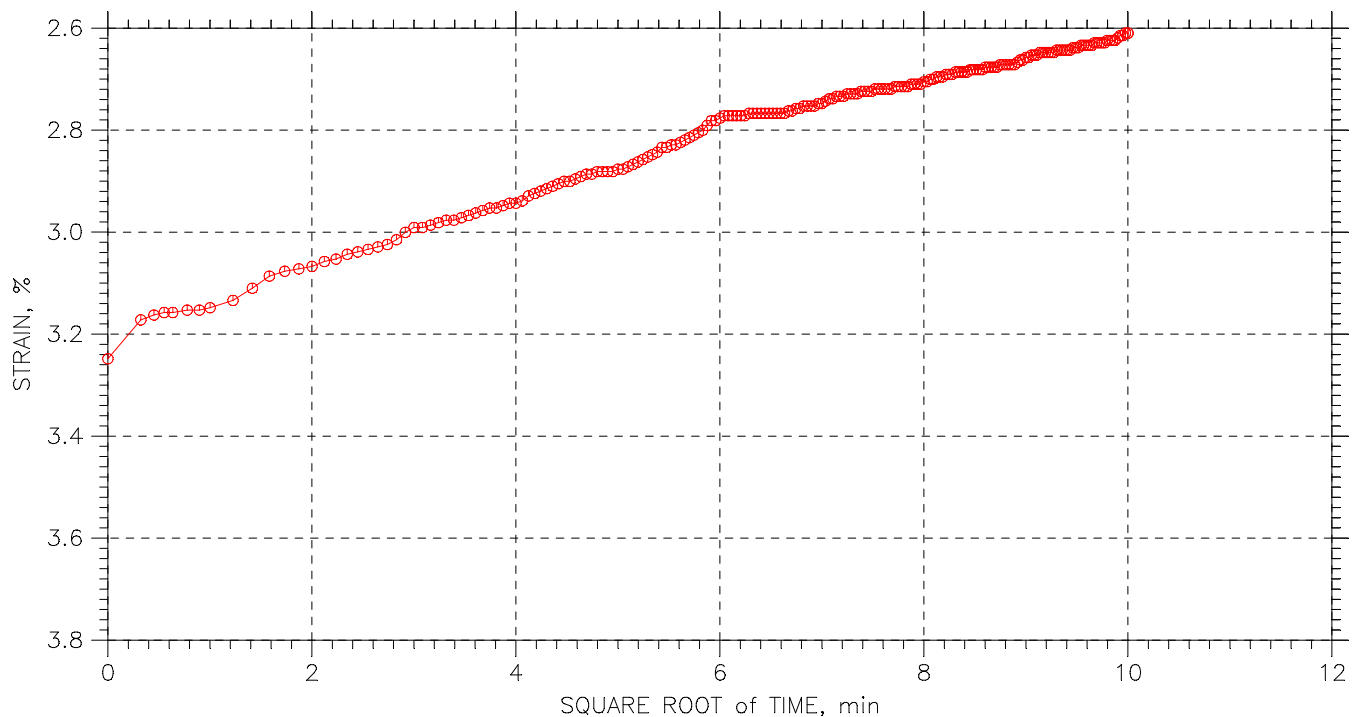
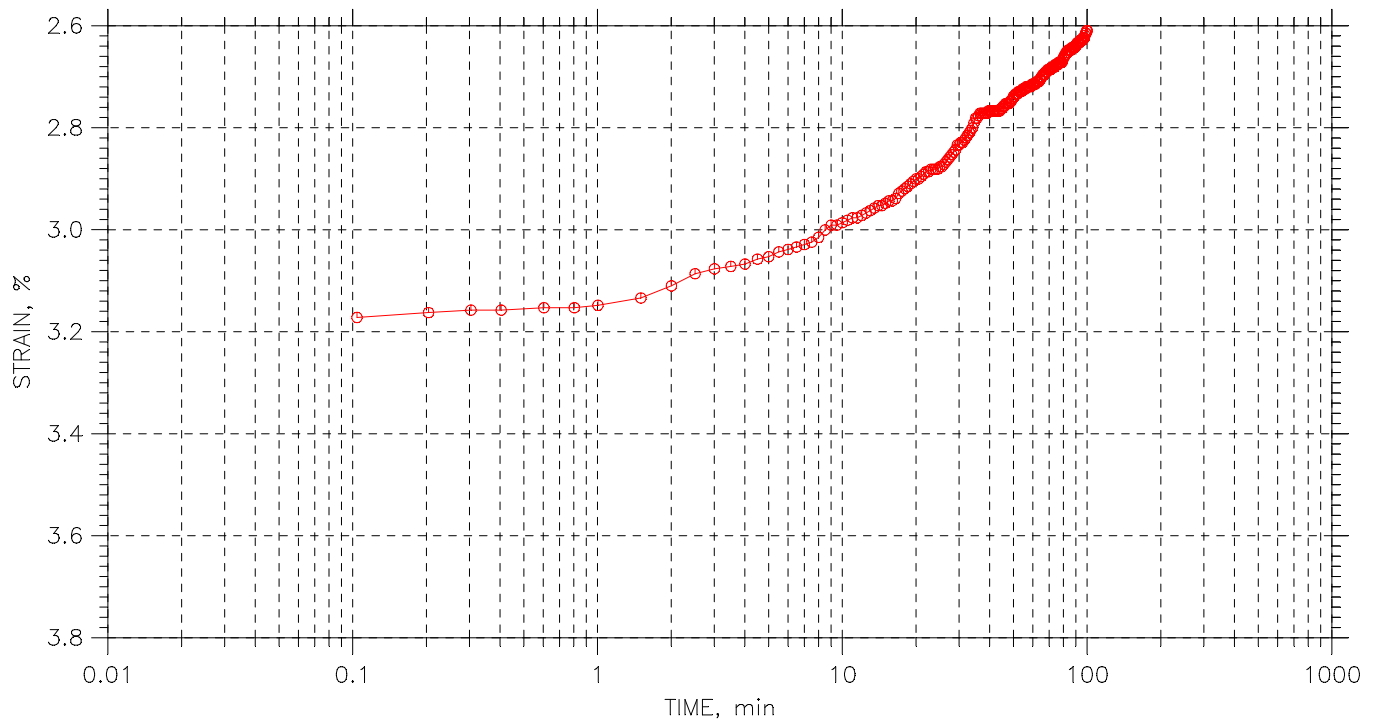
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 21

Stress: 2. tsf



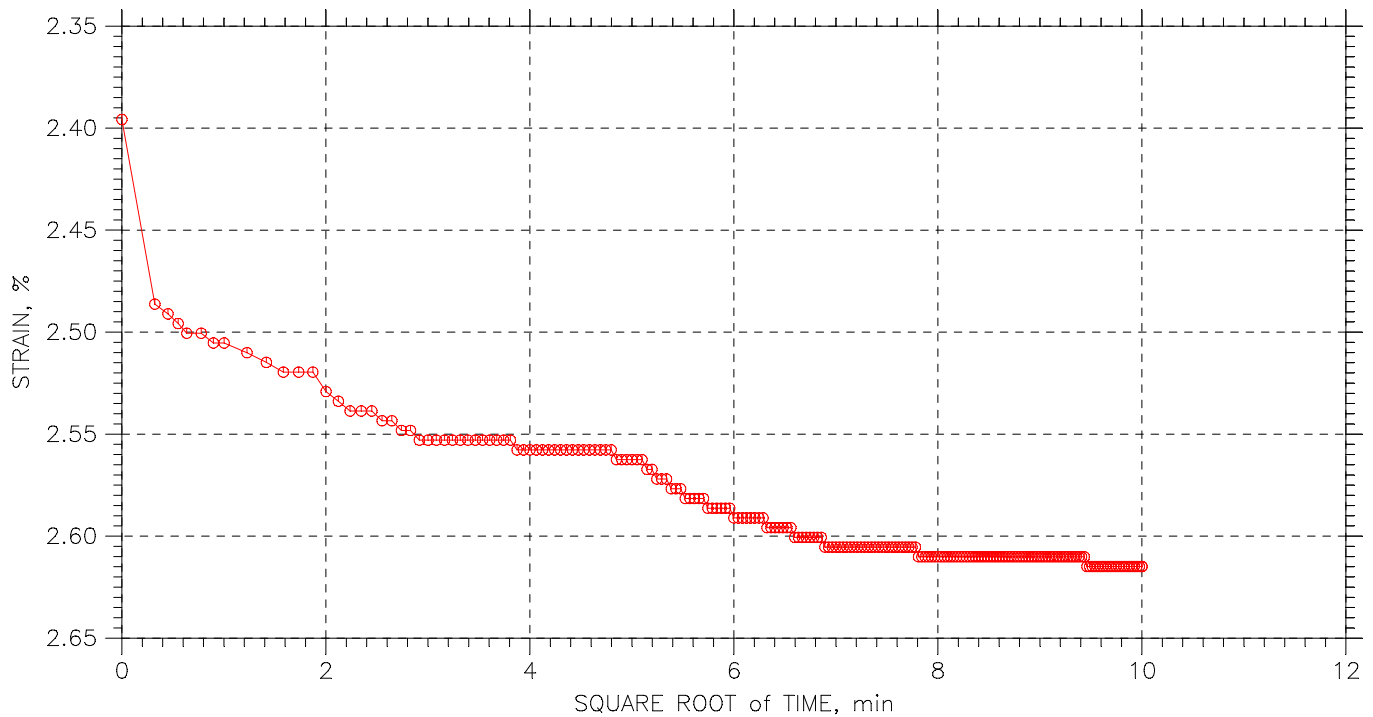
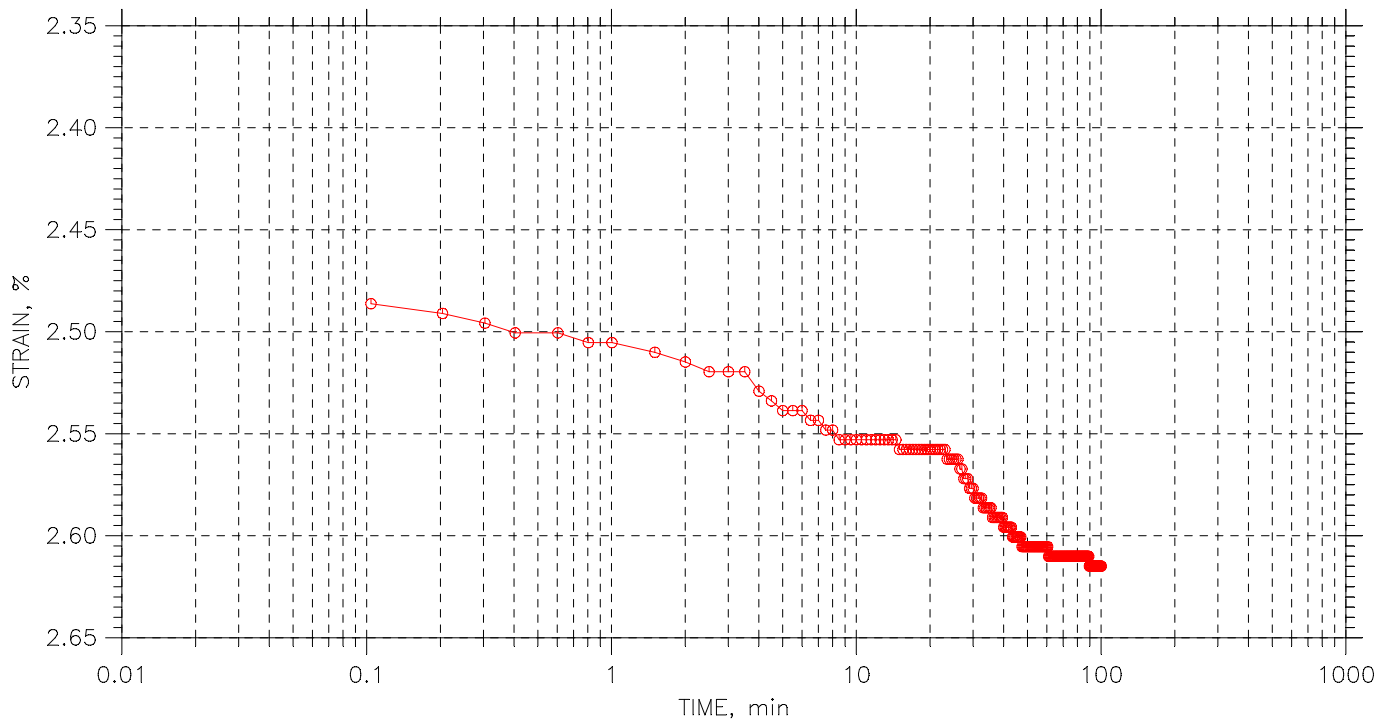
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 21

Stress: 4. tsf



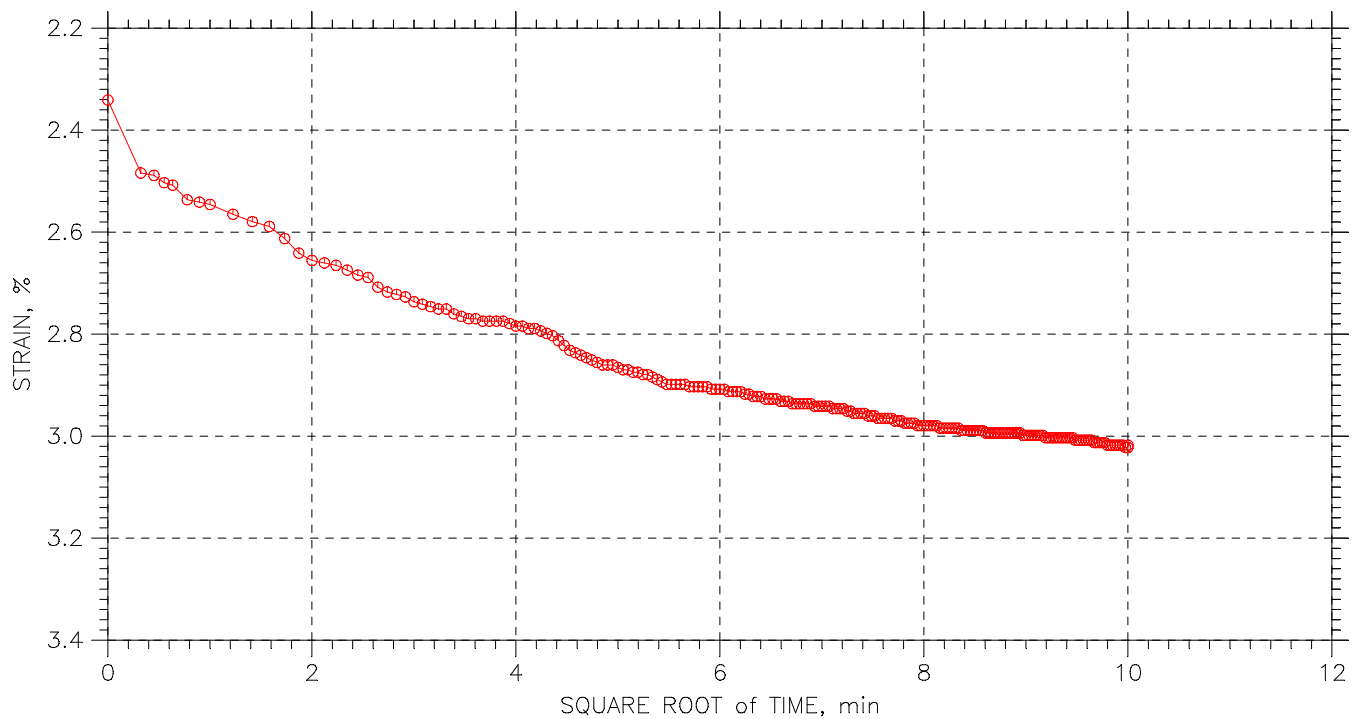
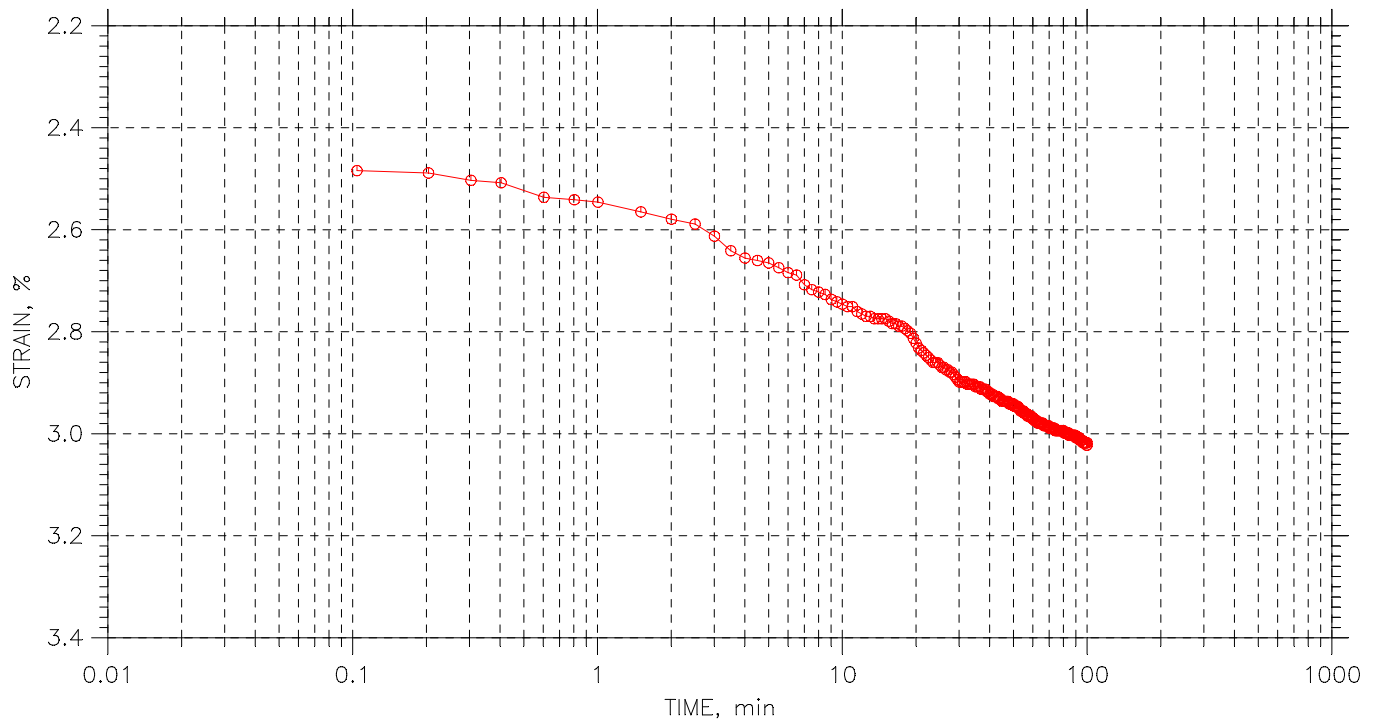
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 14 of 21

Stress: 8. tsf



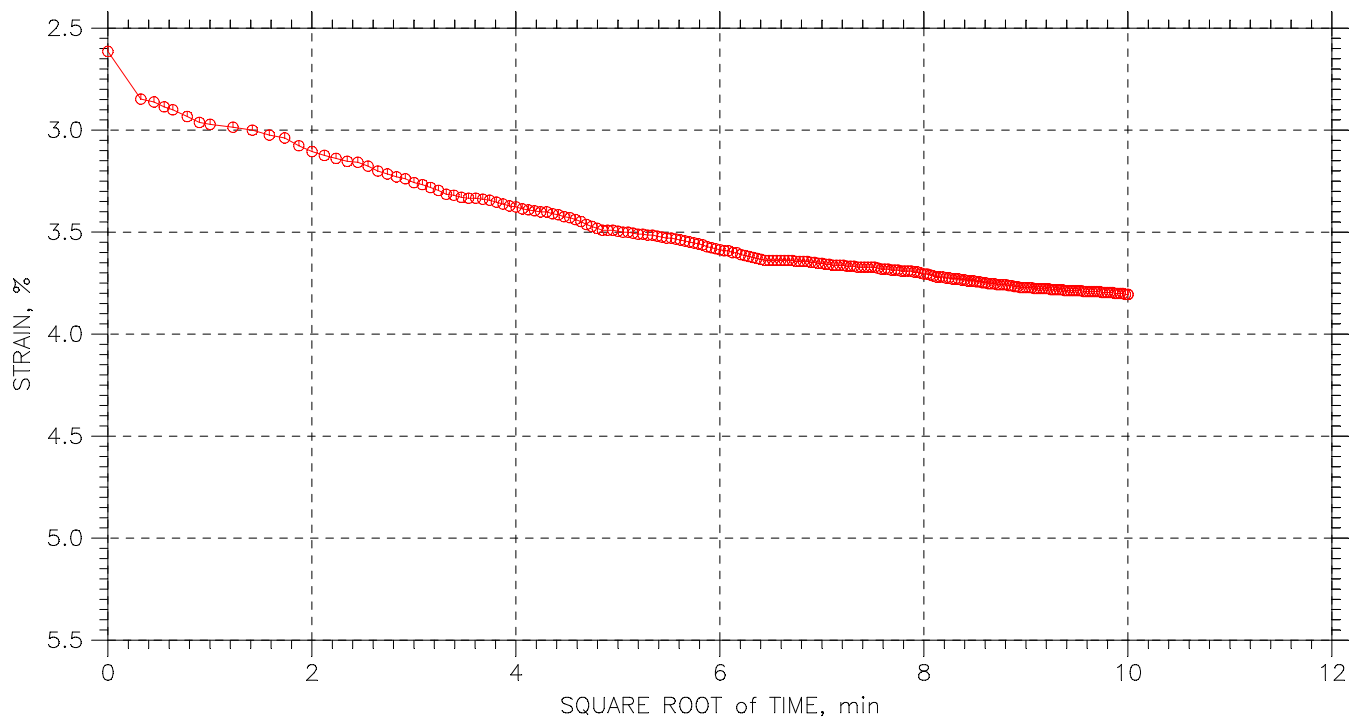
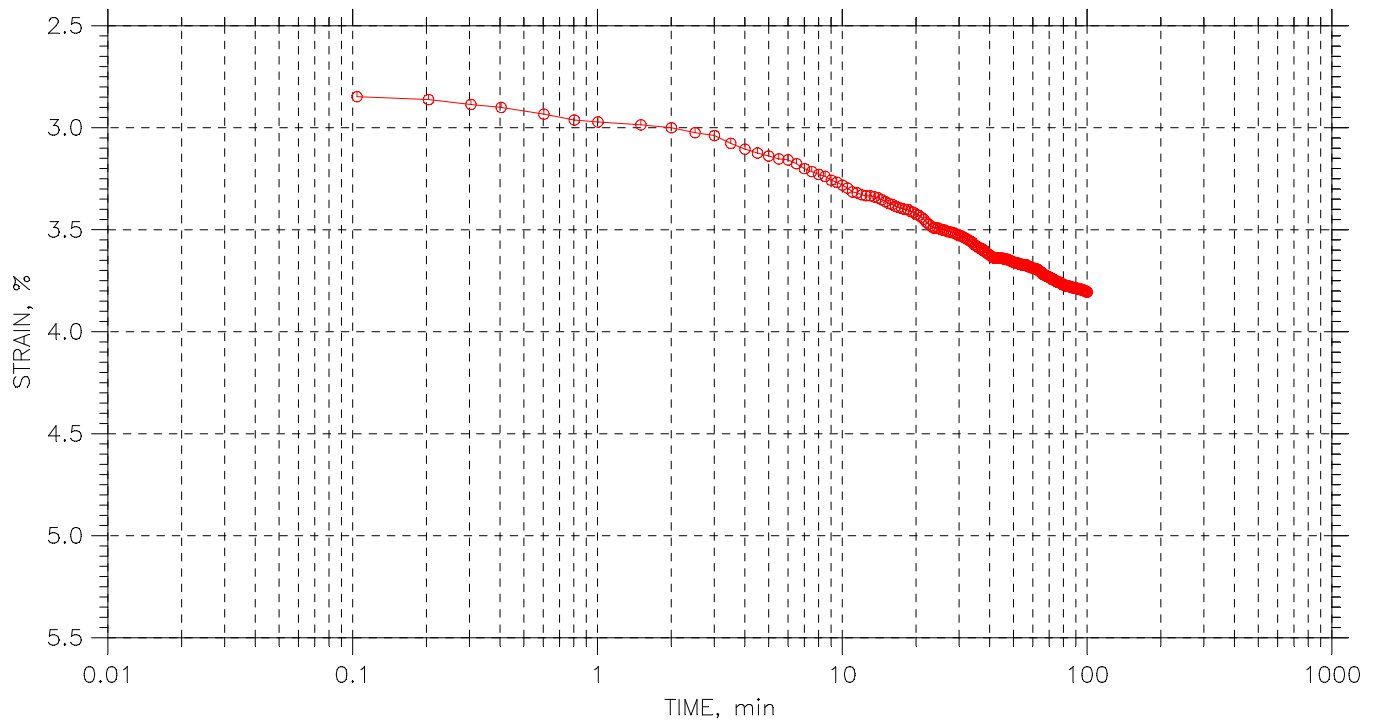
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 15 of 21

Stress: 16. tsf



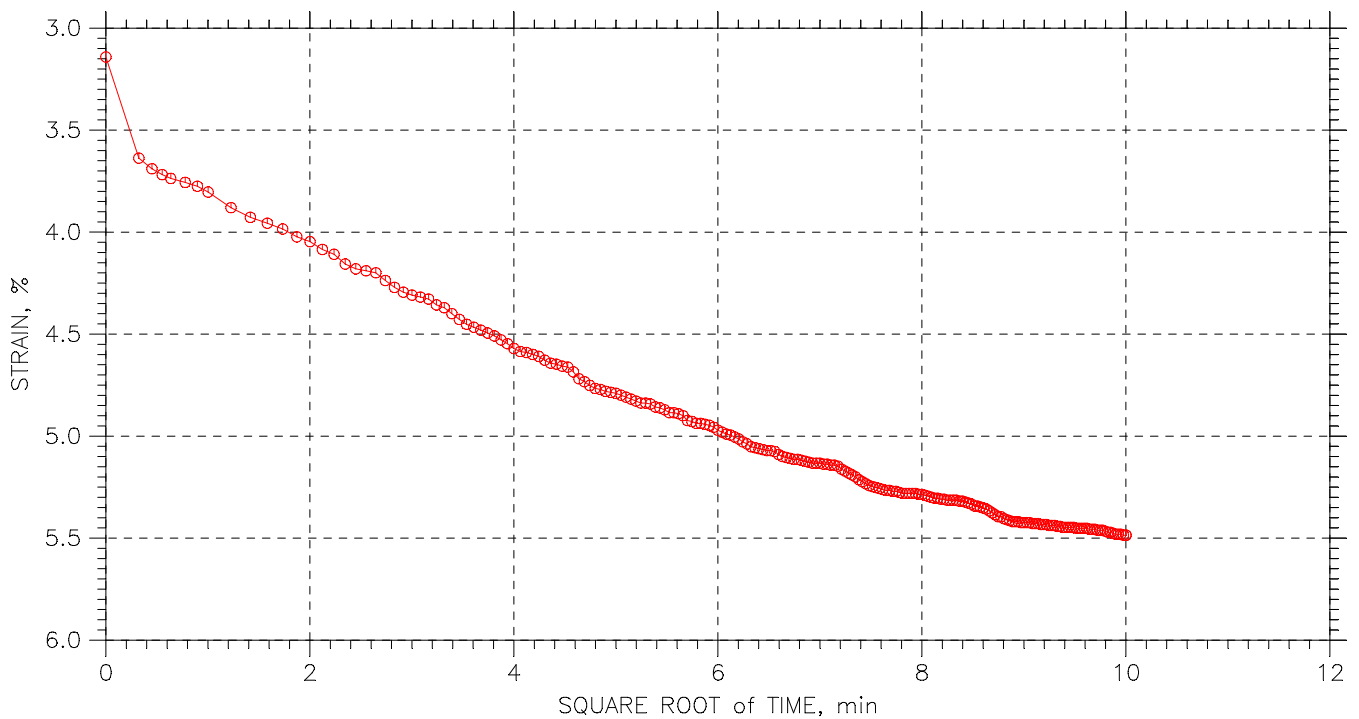
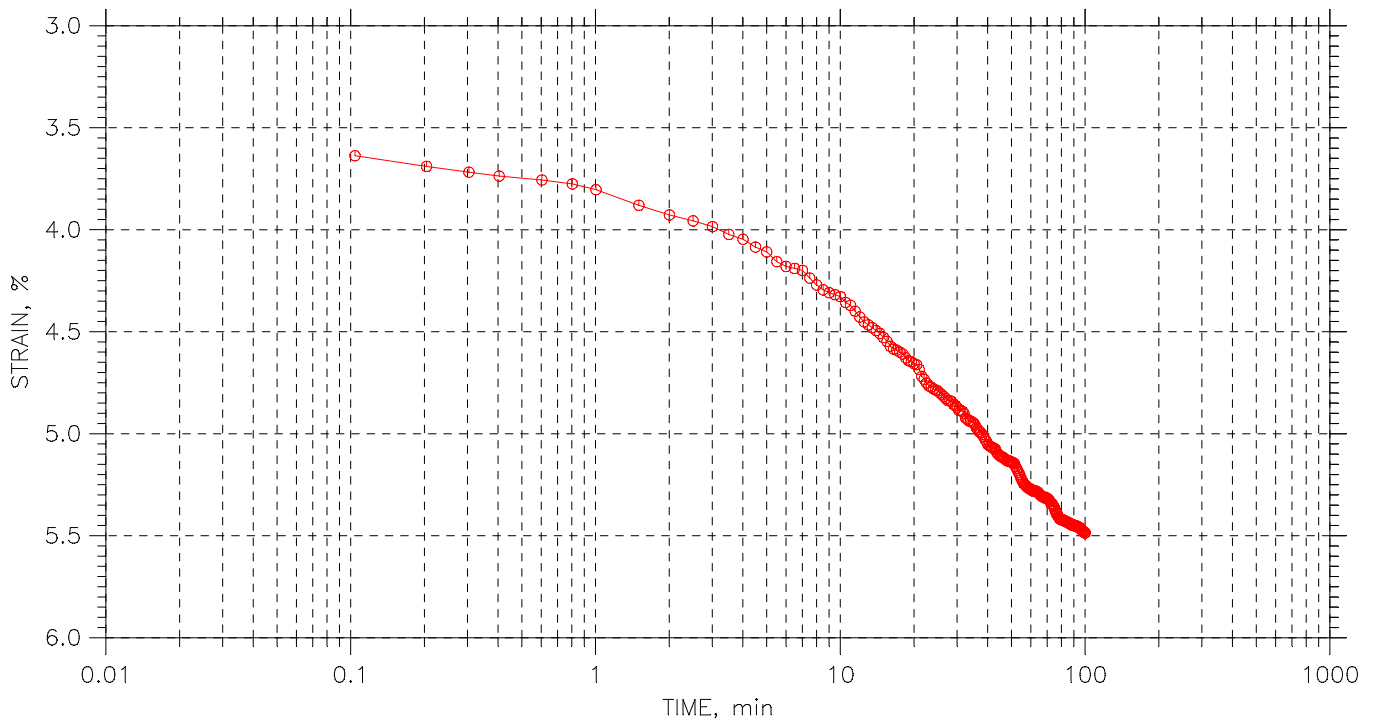
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 16 of 21

Stress: 32. tsf



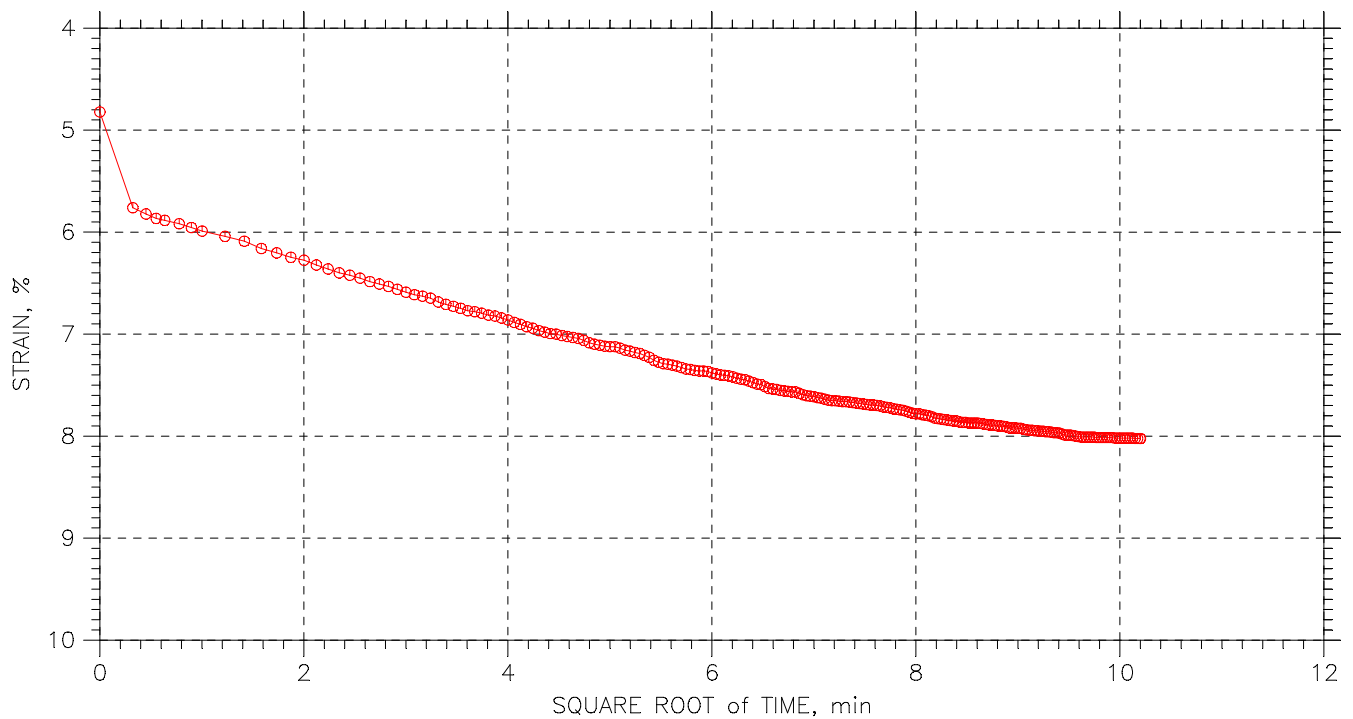
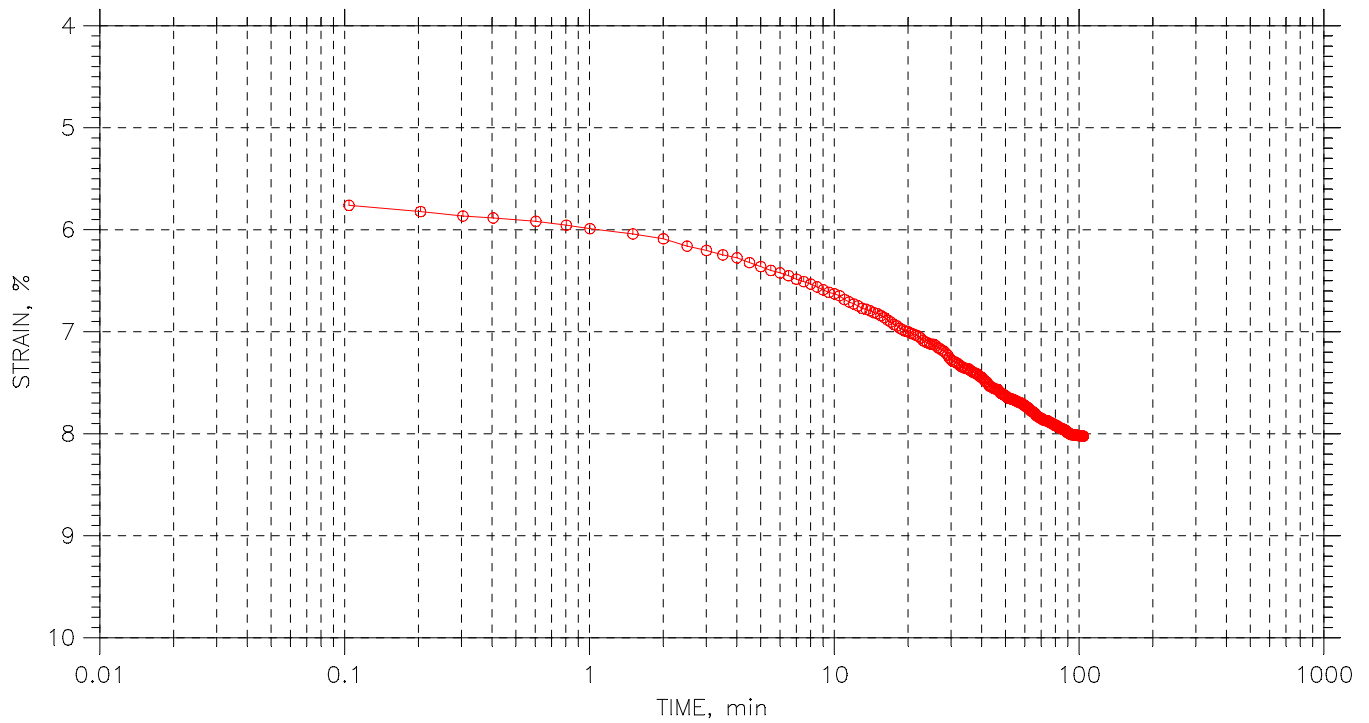
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 17 of 21

Stress: 64. tsf



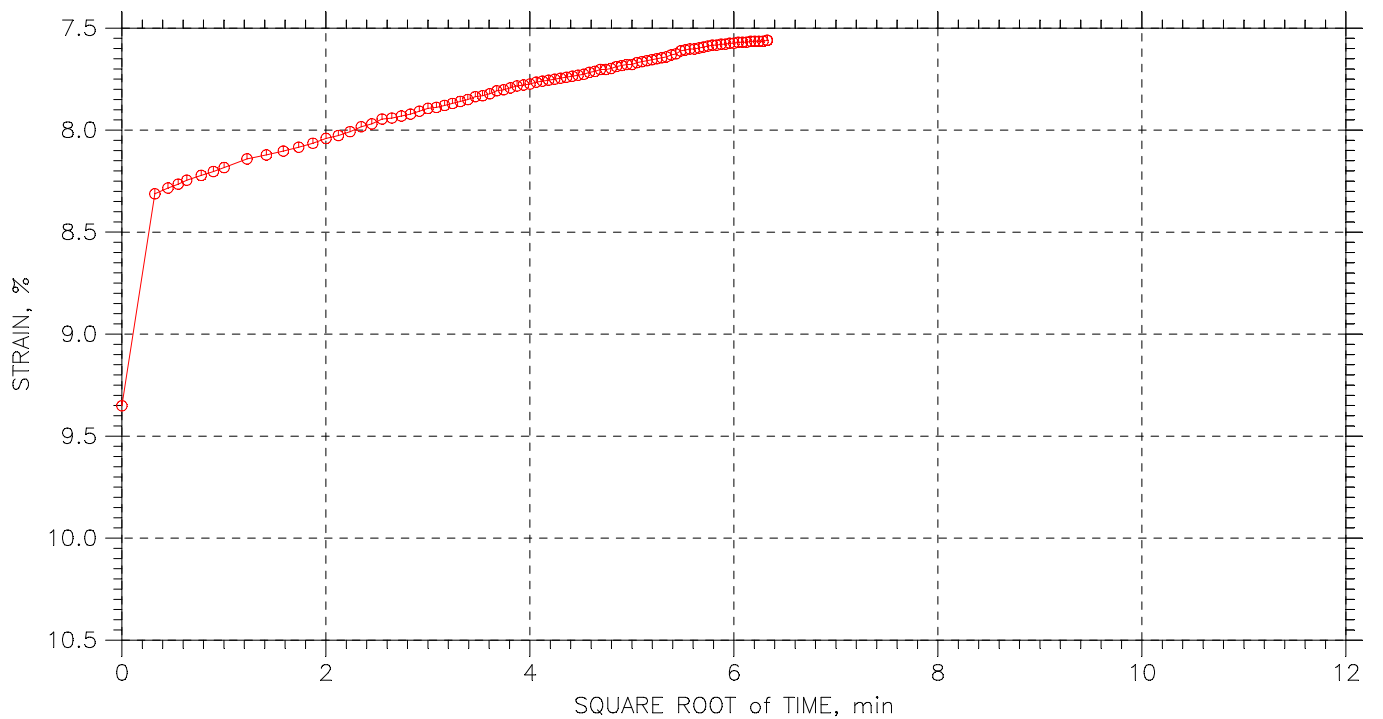
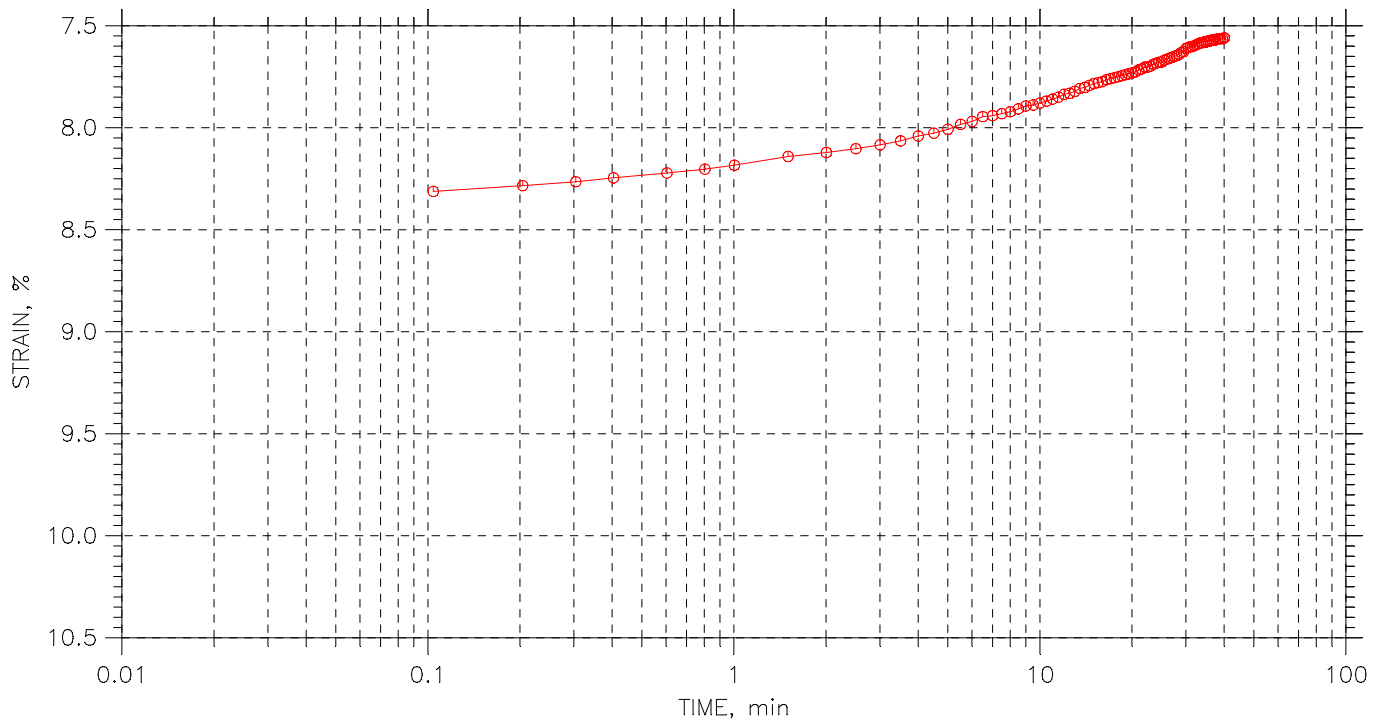
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 18 of 21

Stress: 16. tsf



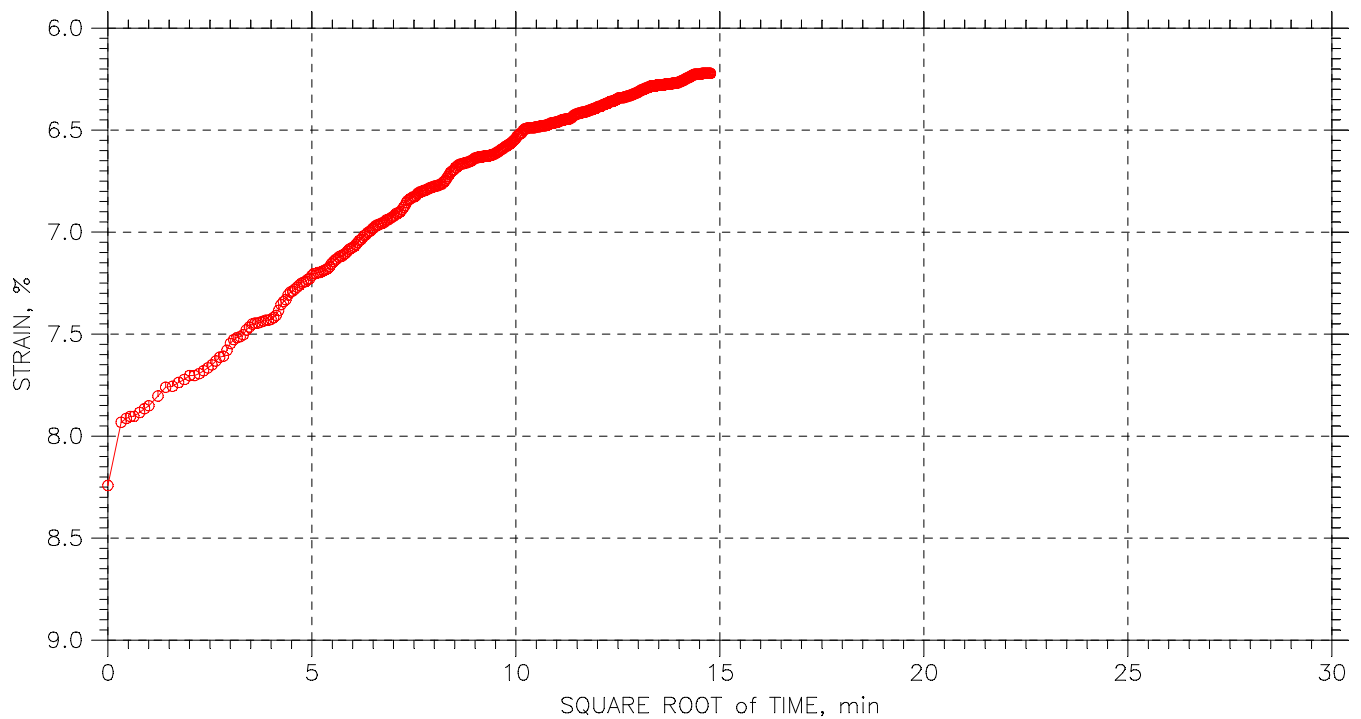
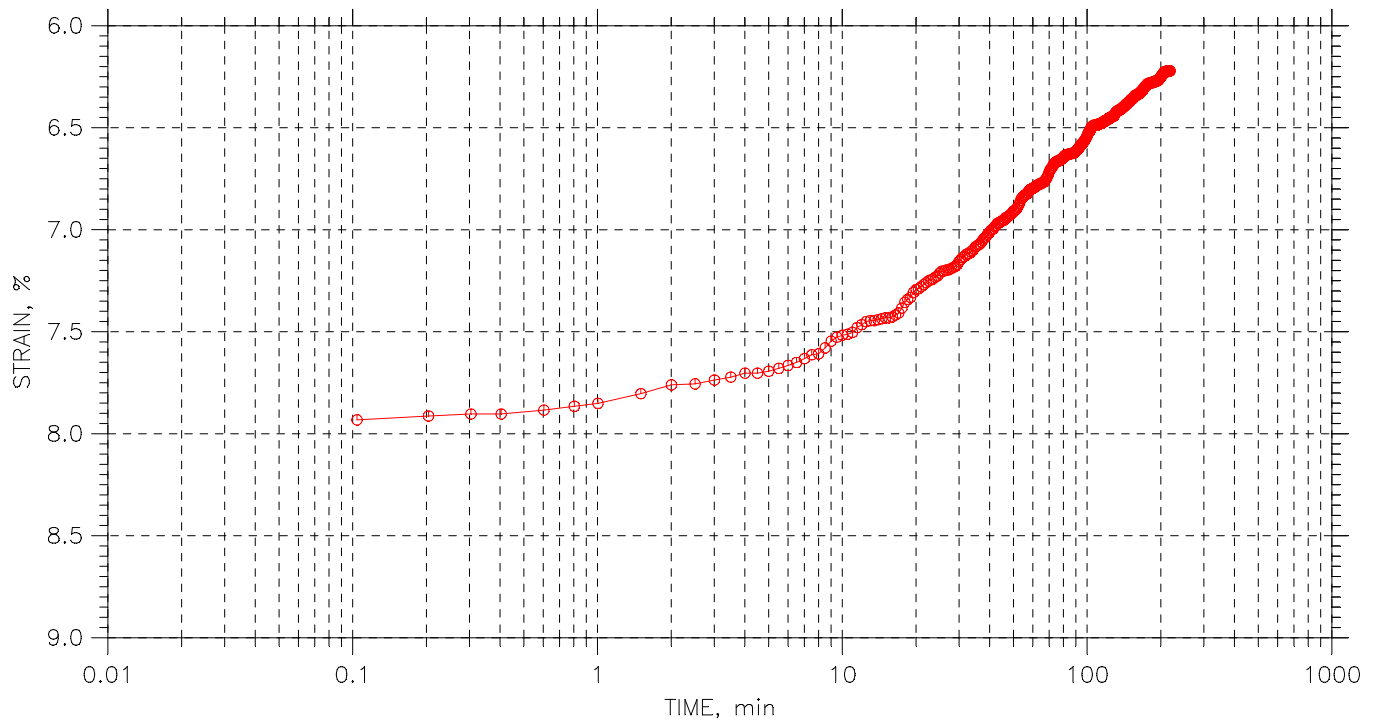
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 19 of 21

Stress: 4. tsf



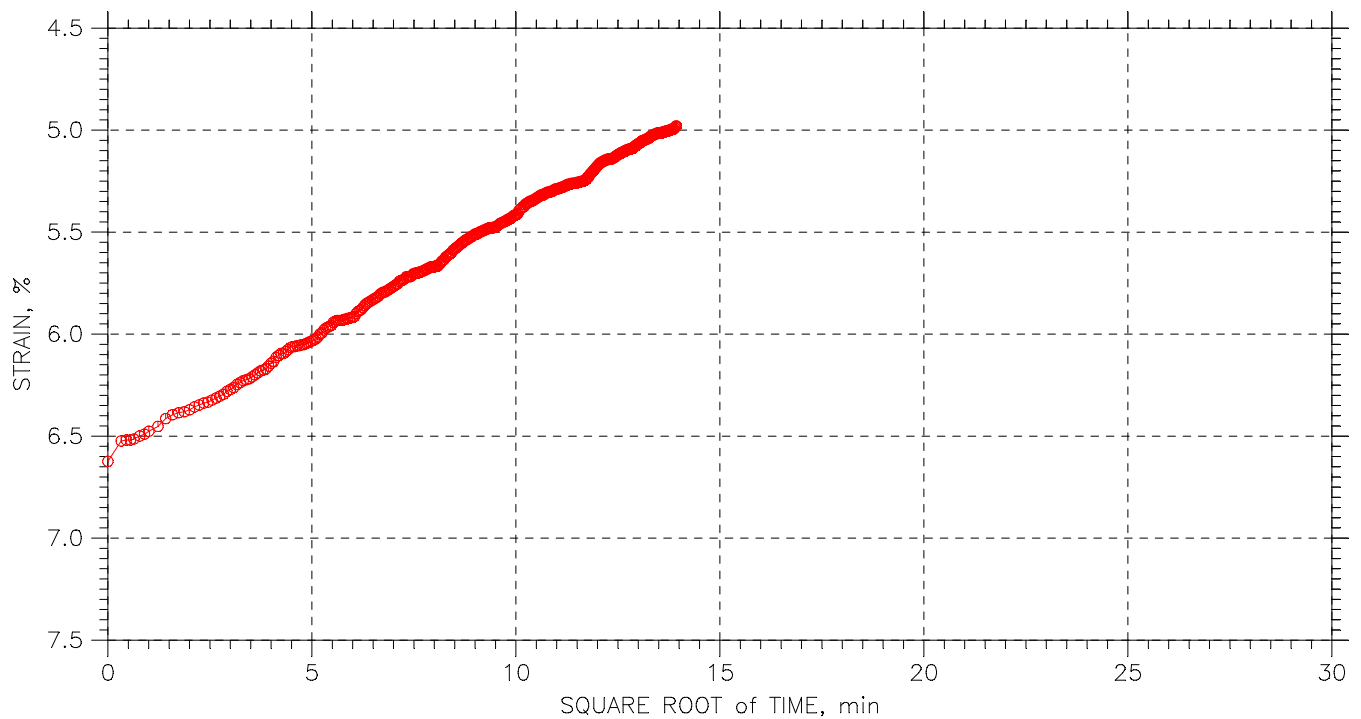
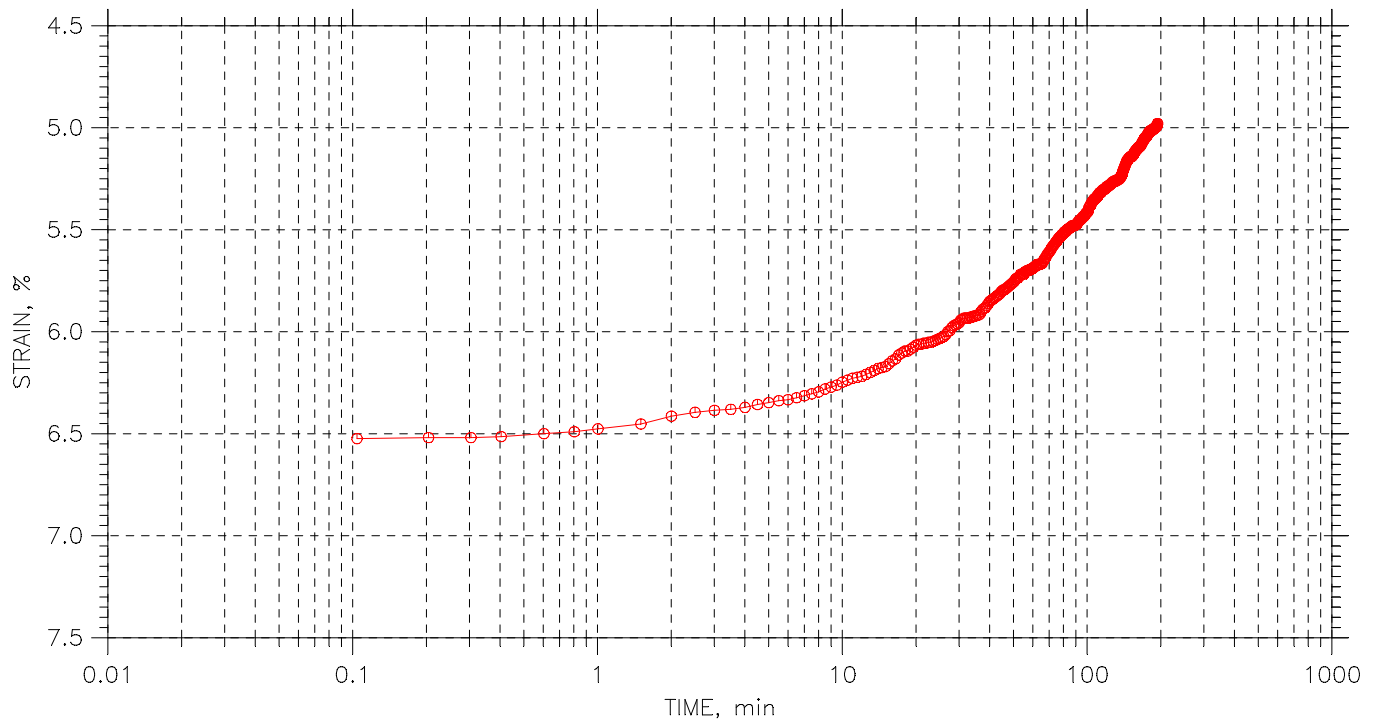
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 20 of 21

Stress: 1. tsf



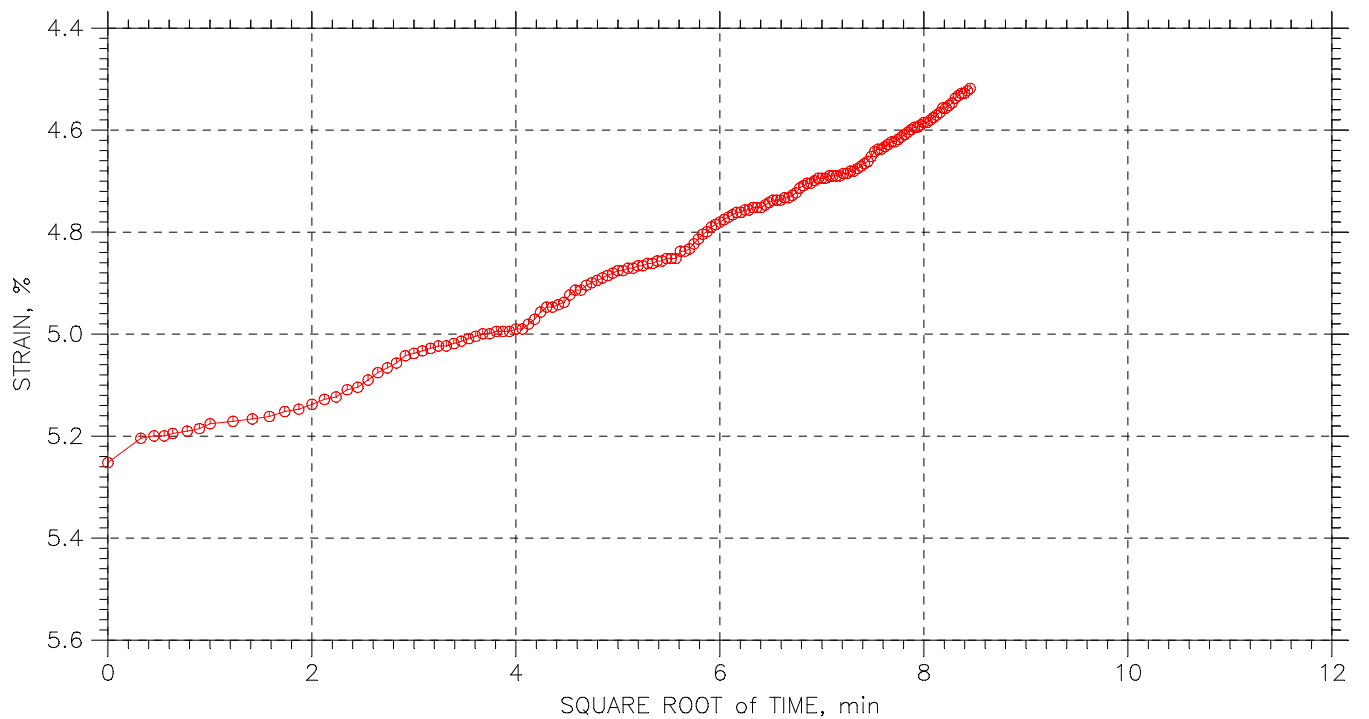
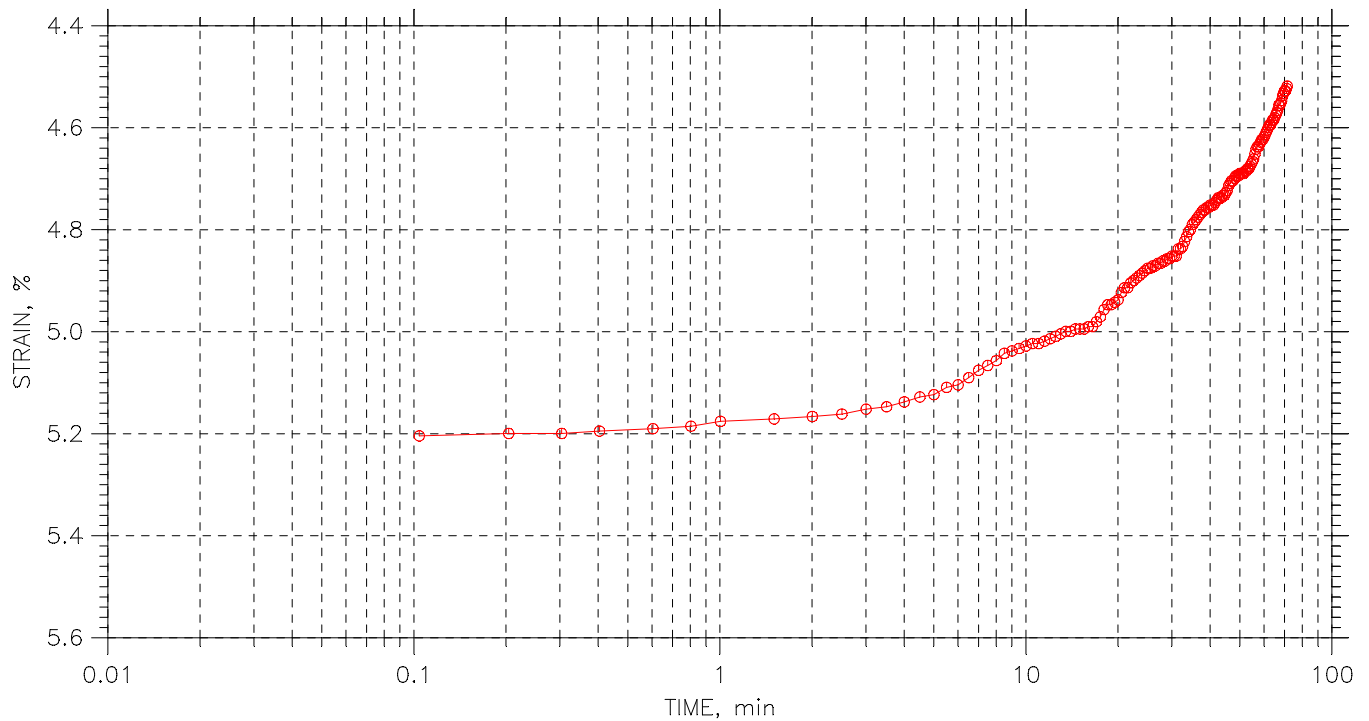
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	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 21 of 21

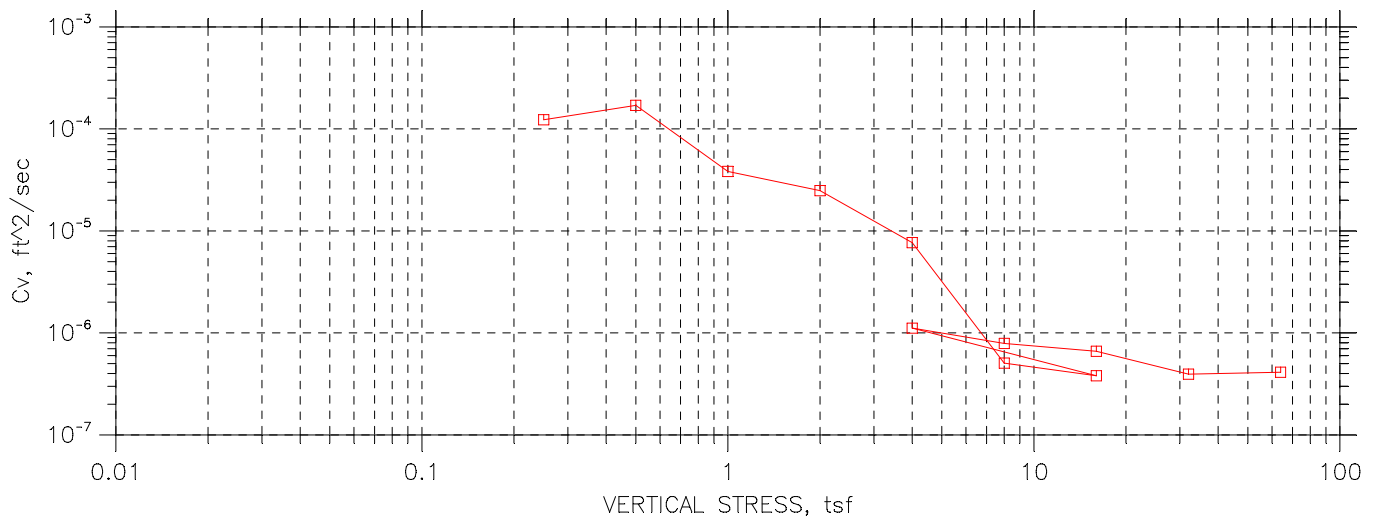
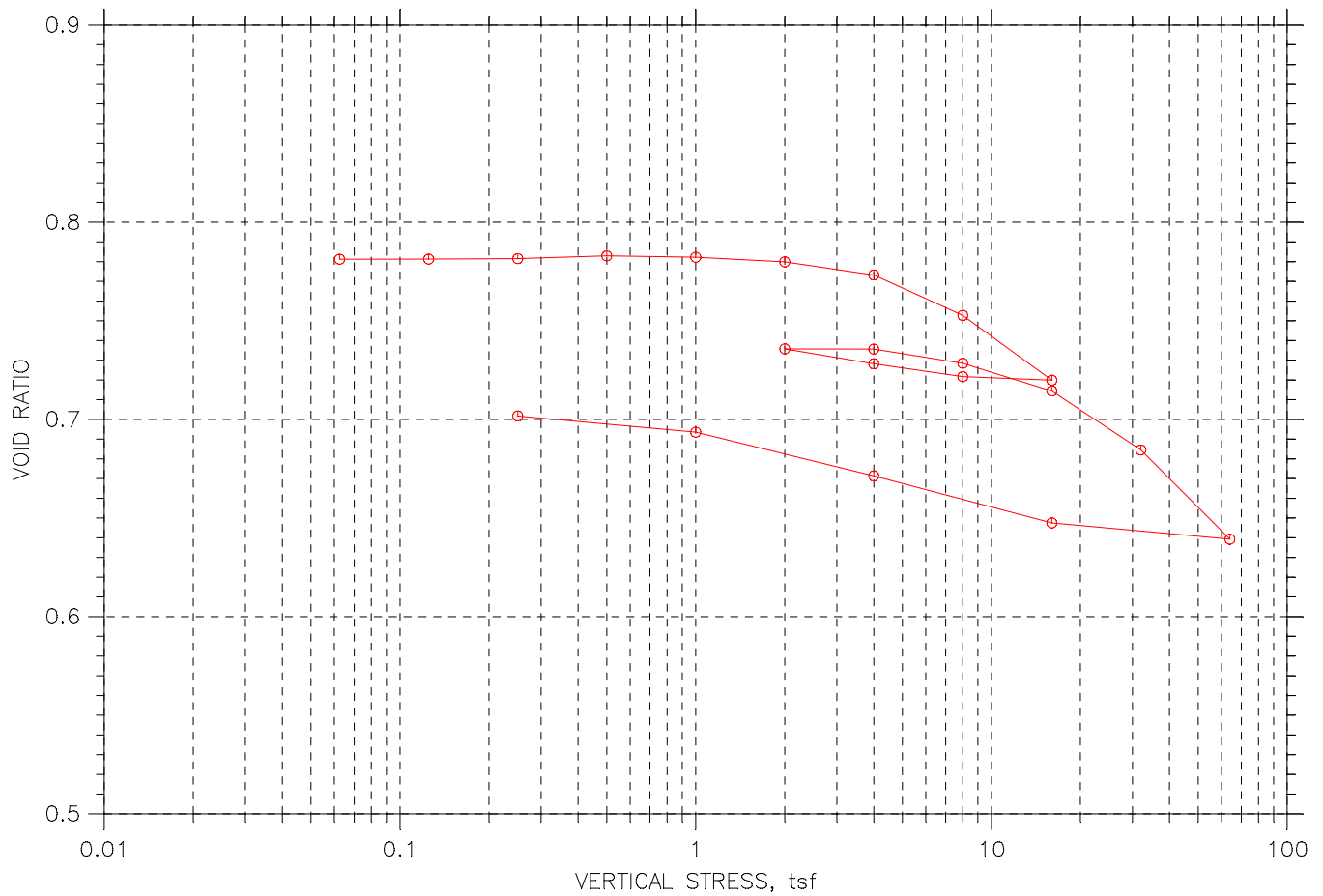
Stress: 0.25 tsf



	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

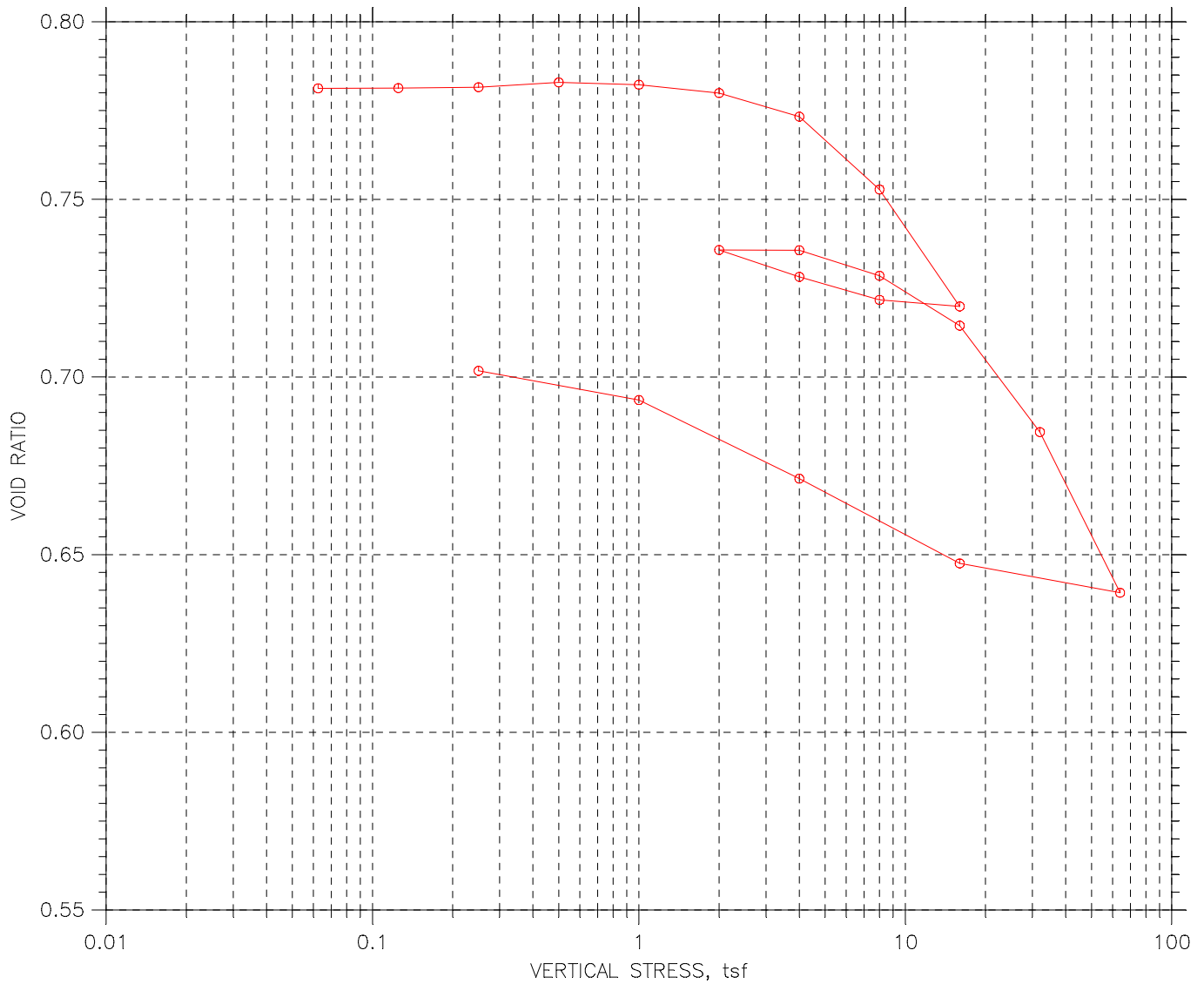
SUMMARY REPORT




	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		

CONSOLIDATION TEST DATA

SUMMARY REPORT

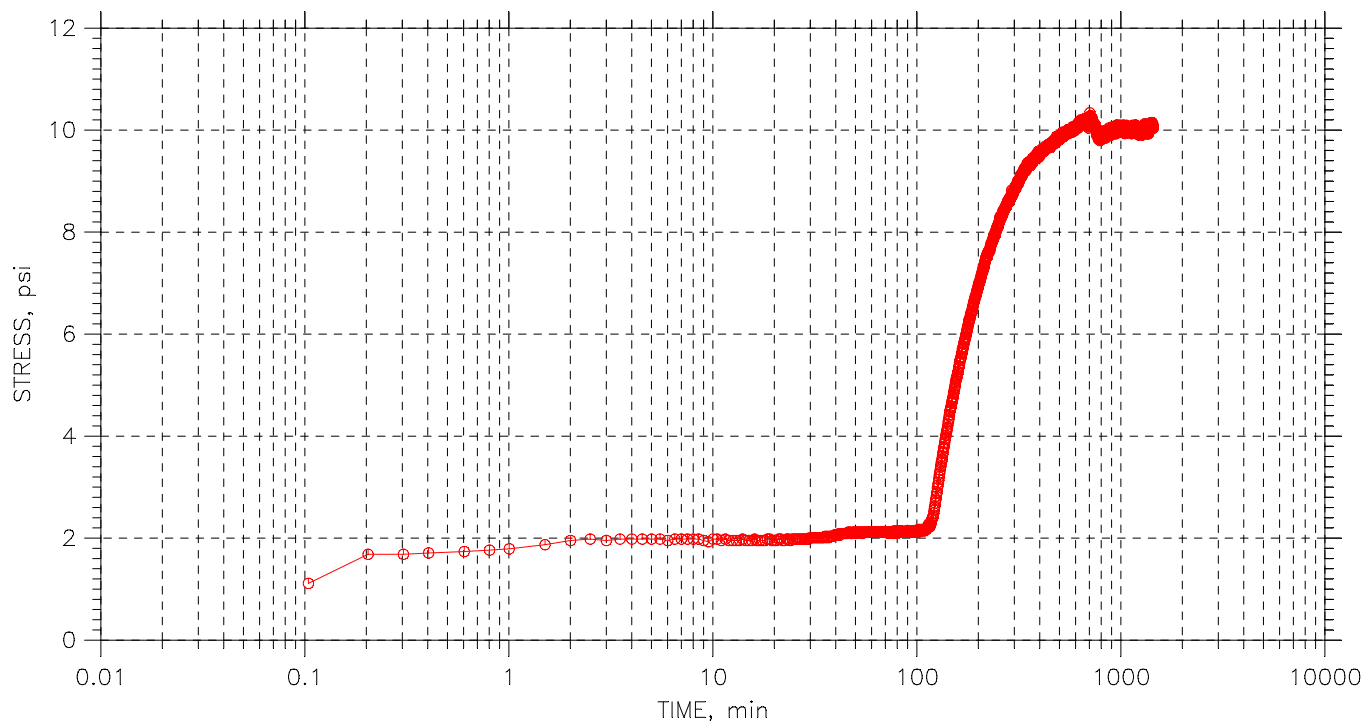
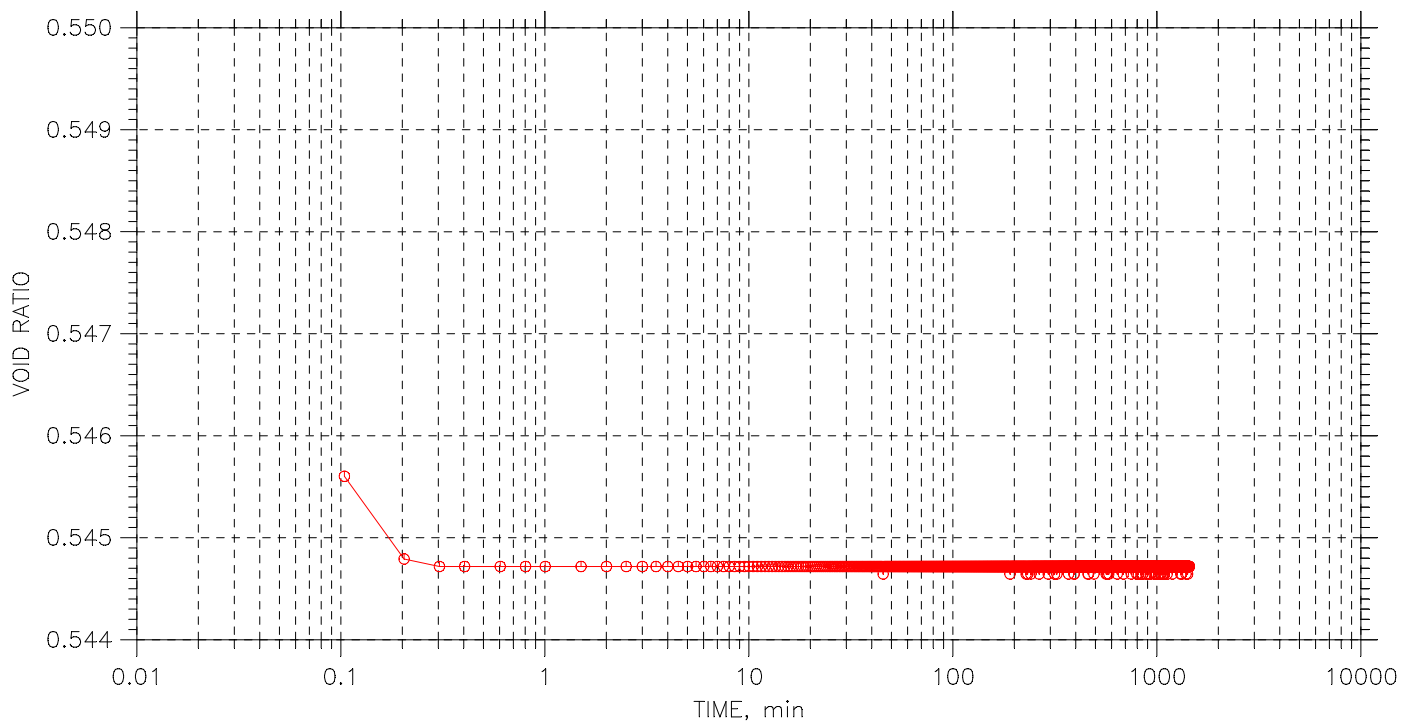


				Before Test	After Test	
Overburden Pressure: 0 tsf				Water Content, %	30.16	24.67
Preconsolidation Pressure: 0 tsf				Dry Unit Weight, pcf	94.57	99.05
Compression Index: 0				Saturation, %	104.11	94.92
Diameter: 1.987 in		Height: 1 in		Void Ratio	0.78	0.70
LL: 63	PL: 27	PI: 36	GS: 2.70			

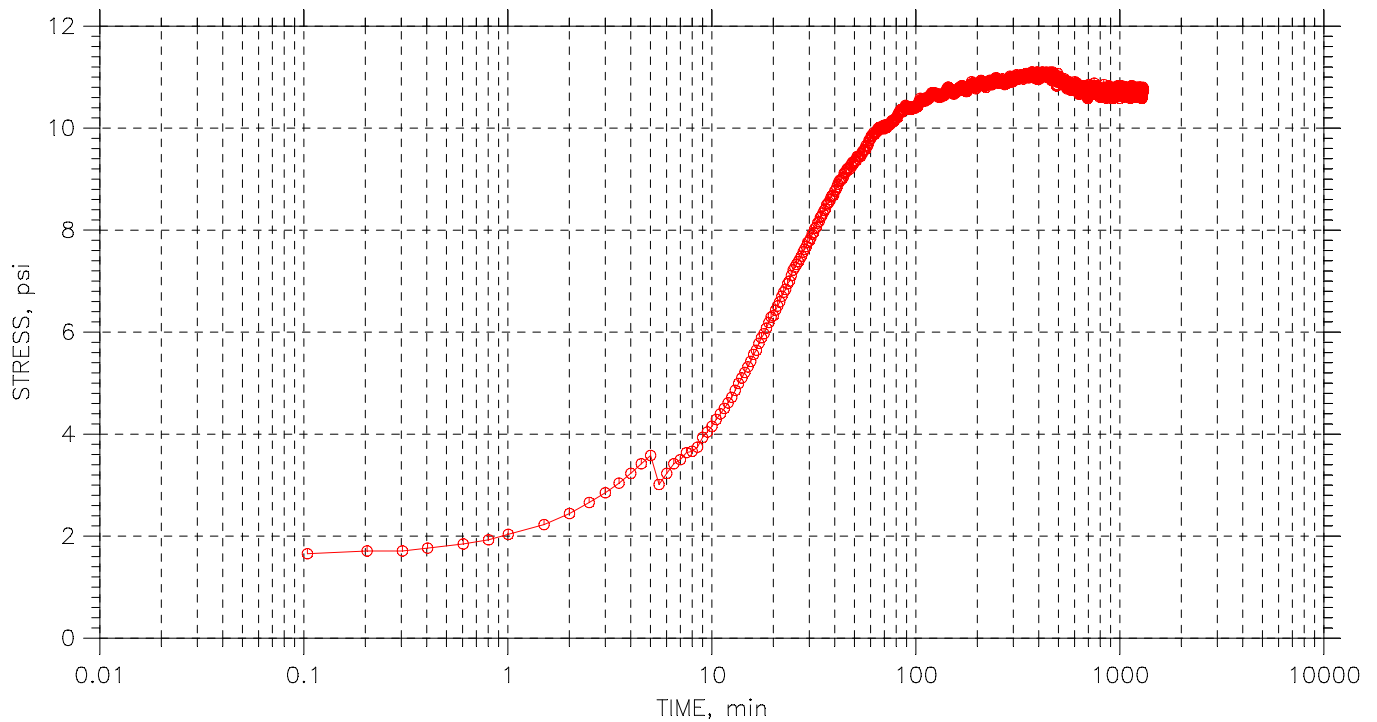
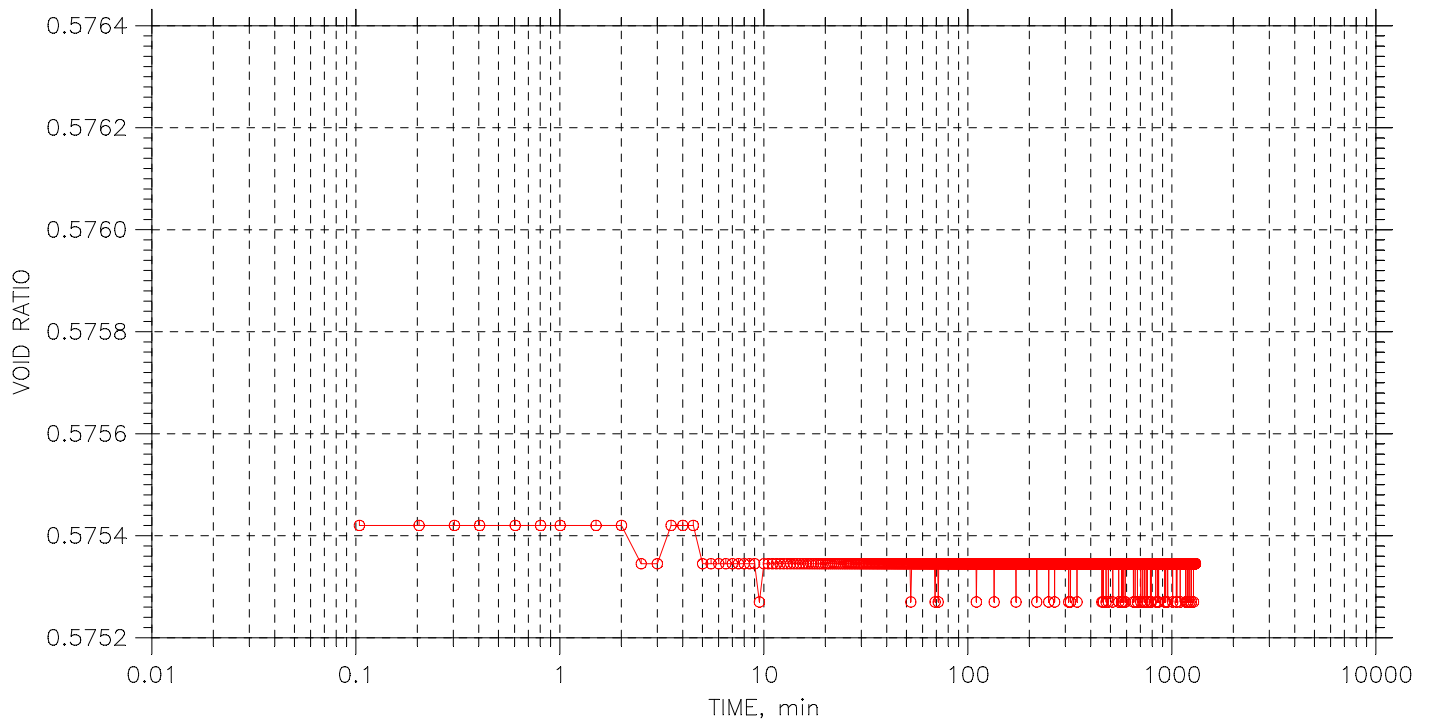
	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 8/7/07	Depth: 29.6ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff, CLAY, trace fine Sand. (CH).		
	Remarks: ASTM D2435.		



ONE-DIMENSIONAL SWELL TEST RESULTS



	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-2A	Tested By: sam	Checked By: bert
	Sample No.: P-3	Test Date: 8/17/07	Depth: 56.9ft
	Test No.: No. 1	Sample Type: Pitcher Sam	Elevation:
	Description: Dark Reddish Brown, Stiff CLAY, trace fine Sand. (CH)		
	Remarks: ASTM D4546, 1-D Dimemsnional Swell Test, Constant Volume.		

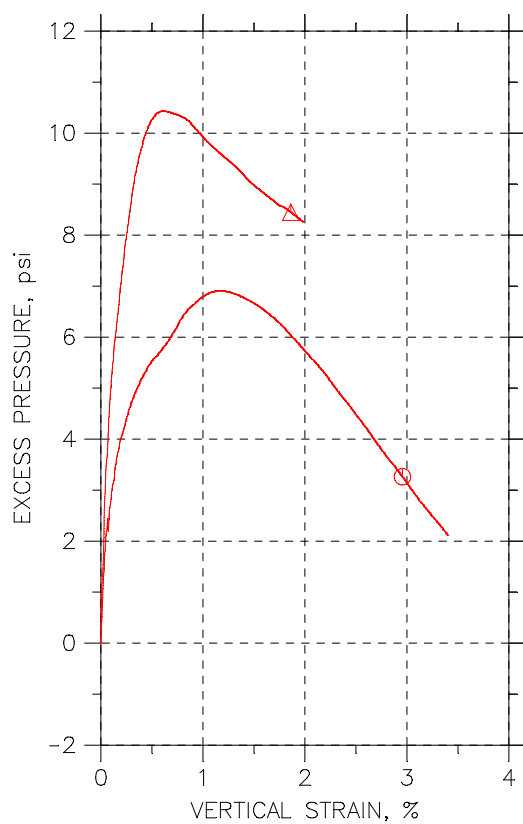
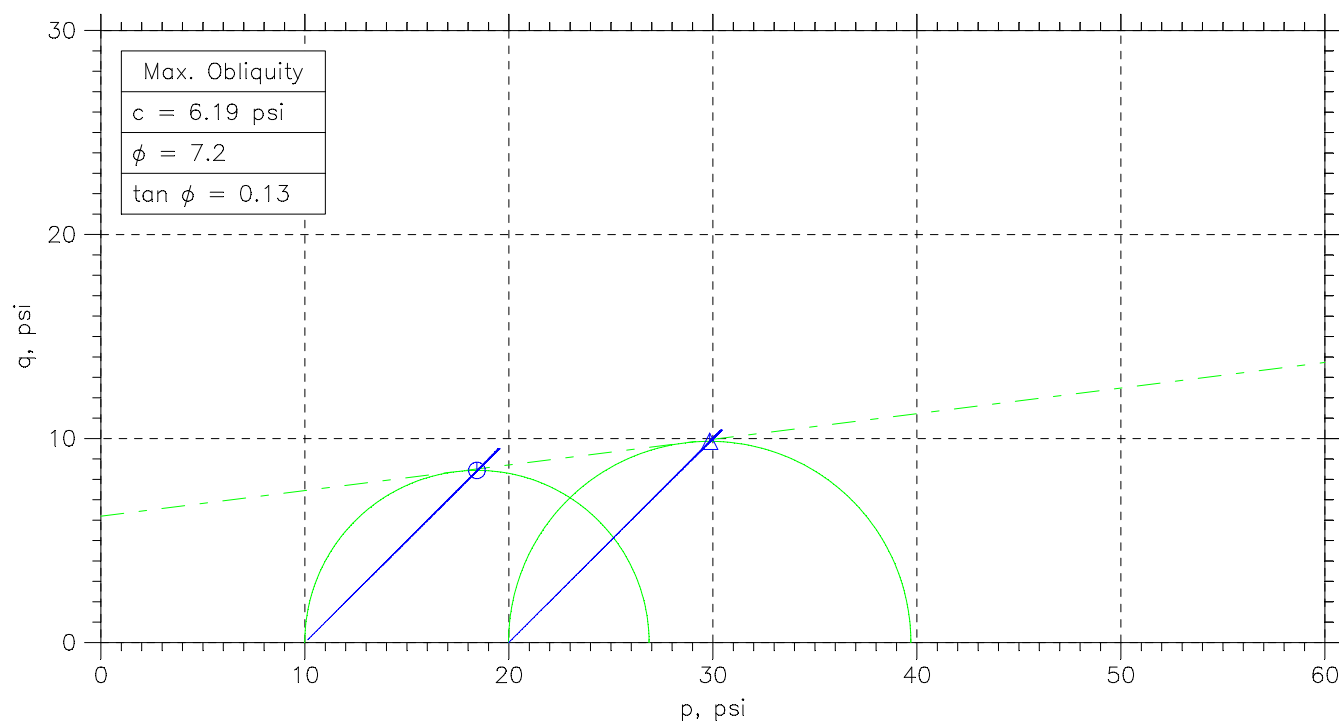


	Project: Purple Line	Location: College Park, MD	Project No.: 14961-0
	Boring No.: CP-3A	Tested By: sam	Checked By: bert
	Sample No.: P-3	Test Date: 8/18/07	Depth: 64.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Dark Gray Medium Stiff CLAY with Silt and Fine Sand Lenses. (CH)		
	Remarks: ASTM D4546. 1-D Swell Test, Constant Volume.		



ISOTROPICALLY CONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	Δ		
Sample No.	P-1	P-1		
Test No.	1	2		
Depth	25.5	26.0		
Initial	Diameter, in	2.858	2.858	
	Height, in	6.062	6.052	
	Water Content, %	26.2	24.9	
	Dry Density, pcf	101.5	103.1	
	Saturation, %	106.9	105.9	
Before Shear	Void Ratio	0.661	0.635	
	Water Content, %	25.6	28.6	
	Dry Density, pcf	99.69	95.04	
	Saturation*, %	100.0	100.0	
	Void Ratio	0.691	0.774	
Before Shear	Back Press., psi	124.	101.	
	Ver. Eff. Cons. Stress, psi	9.985	20.03	
	Shear Strength, psi	9.496	10.41	
	Strain at Failure, %	2.96	1.86	
	Strain Rate, %/min	0.04	0.04	
Before Shear	B-Value		0.98	
	Estimated Specific Gravity	2.7	2.7	
	Liquid Limit	74	74	
	Plastic Limit	25	25	

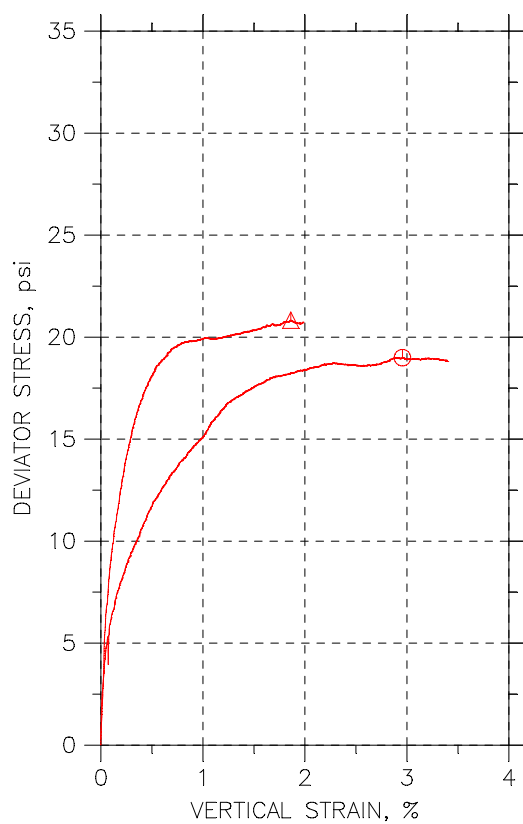
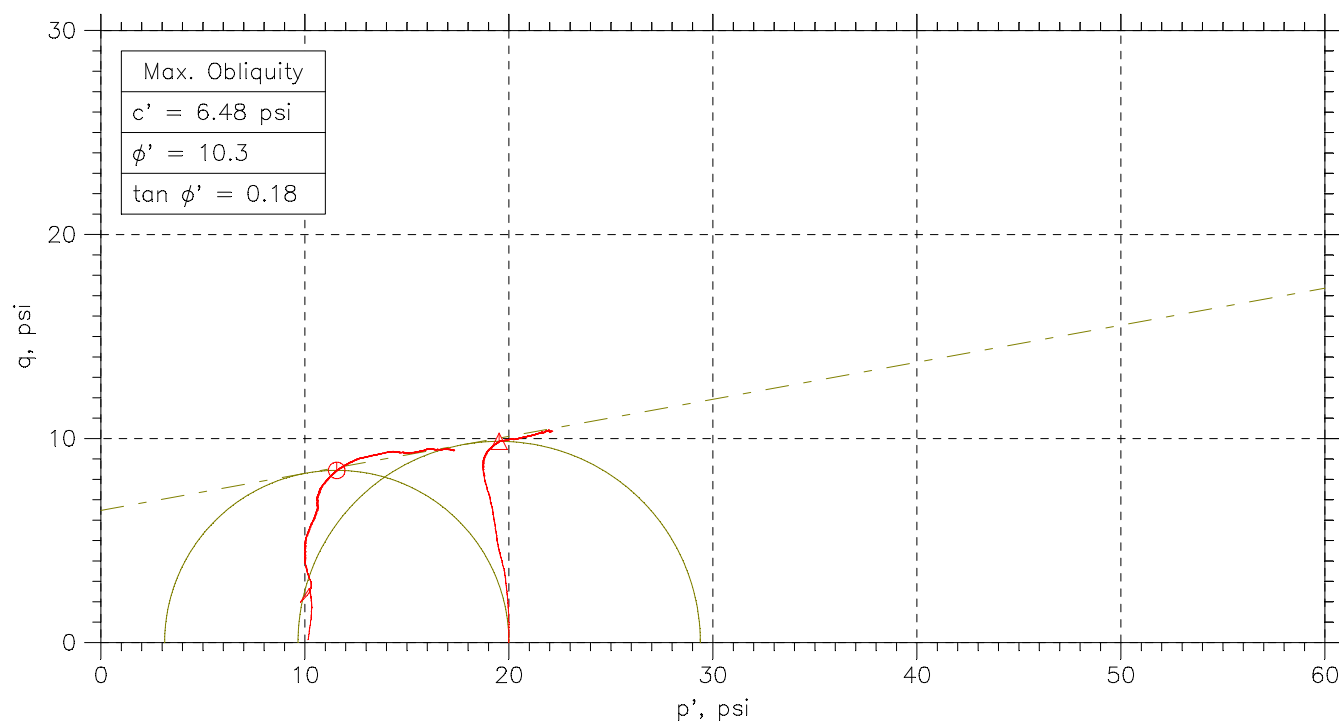


Project: Purple Line	
Location: College Park, MD	
Project No.: 14961-0	
Boring No.: CP-2A	
Sample Type: Pitcher	
Description: Mottled Gray, Red, and Black, Medium Stiff Silty CLAY, a little fine to medium Sand. (CH)	
Remarks:	

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊖	Δ		
Sample No.	P-1	P-1		
Test No.	1	2		
Depth	25.5	26.0		
Initial	Diameter, in	2.858	2.858	
	Height, in	6.062	6.052	
	Water Content, %	26.2	24.9	
	Dry Density, pcf	101.5	103.1	
	Saturation, %	106.9	105.9	
Before Shear	Void Ratio	0.661	0.635	
	Water Content, %	25.6	28.6	
	Dry Density, pcf	99.69	95.04	
	Saturation*, %	100.0	100.0	
	Void Ratio	0.691	0.774	
	Back Press., psi	124.	101.	
	Ver. Eff. Cons. Stress, psi	9.985	20.03	
	Shear Strength, psi	9.496	10.41	
	Strain at Failure, %	2.96	1.86	
	Strain Rate, %/min	0.04	0.04	
B-Value			0.98	
Estimated Specific Gravity		2.7	2.7	
Liquid Limit		74	74	
Plastic Limit		25	25	

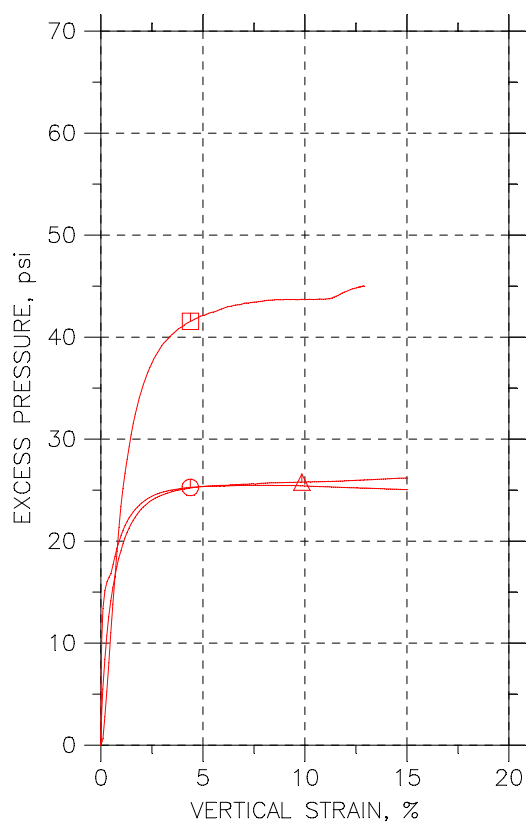
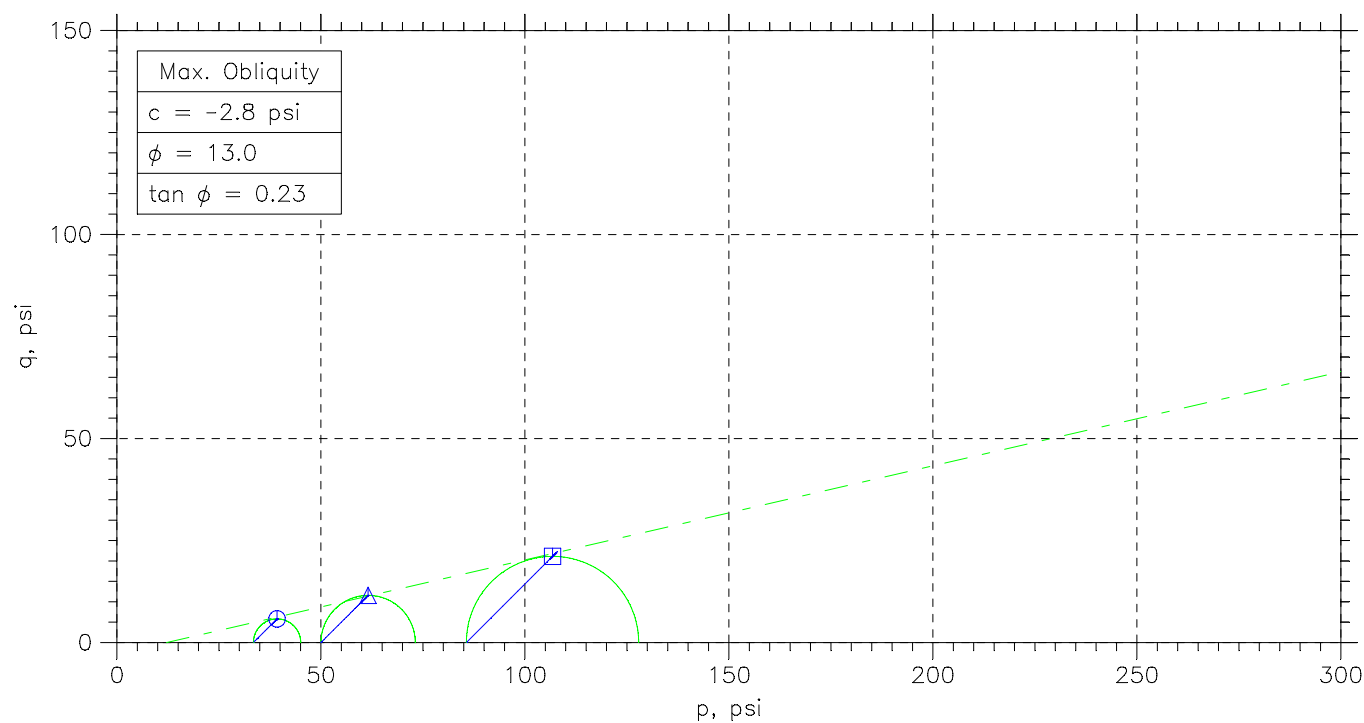


Project: Purple Line	
Location: College Park, MD	
Project No.: 14961-0	
Boring No.: CP-2A	
Sample Type: Pitcher	
Description: Mottled Gray, Red, and Black, Medium Stiff Silty CLAY, a little fine to medium Sand. (CH)	
Remarks:	

Phase calculations based on start and end of test.





* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊖	Δ	□	
Sample No.		P-4	P-4	P-4	
Test No.		1	2	3	
Depth		78.5'	78'	77.5'	
Initial	Diameter, in	2.856	2.862	2.862	
	Height, in	6.089	5.971	5.971	
	Water Content, %	36.8	37.1	35.3	
	Dry Density, pcf	83.12	86.16	87.29	
	Saturation, %	96.8	104.7	102.5	
Before Shear	Void Ratio	1.03	0.956	0.931	
	Water Content, %	29.0	24.9	24.8	
	Dry Density, pcf	94.57	100.9	100.9	
	Saturation*, %	100.1	100.0	100.0	
	Void Ratio	0.782	0.671	0.67	
	Back Press., psi		88.03		
	Ver. Eff. Cons. Stress, psi		49.96	125.	
	Shear Strength, psi	5.841	11.57	22.22	
	Strain at Failure, %	4.38	9.85	4.39	
	Strain Rate, %/min	0.04	0.04	0.04	
B-Value		0.97			
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		63	63	63	
Plastic Limit		25	25	25	

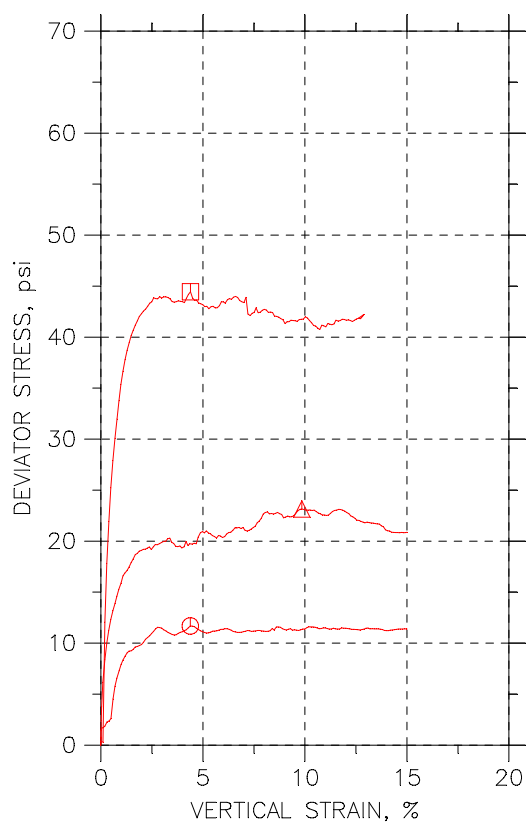
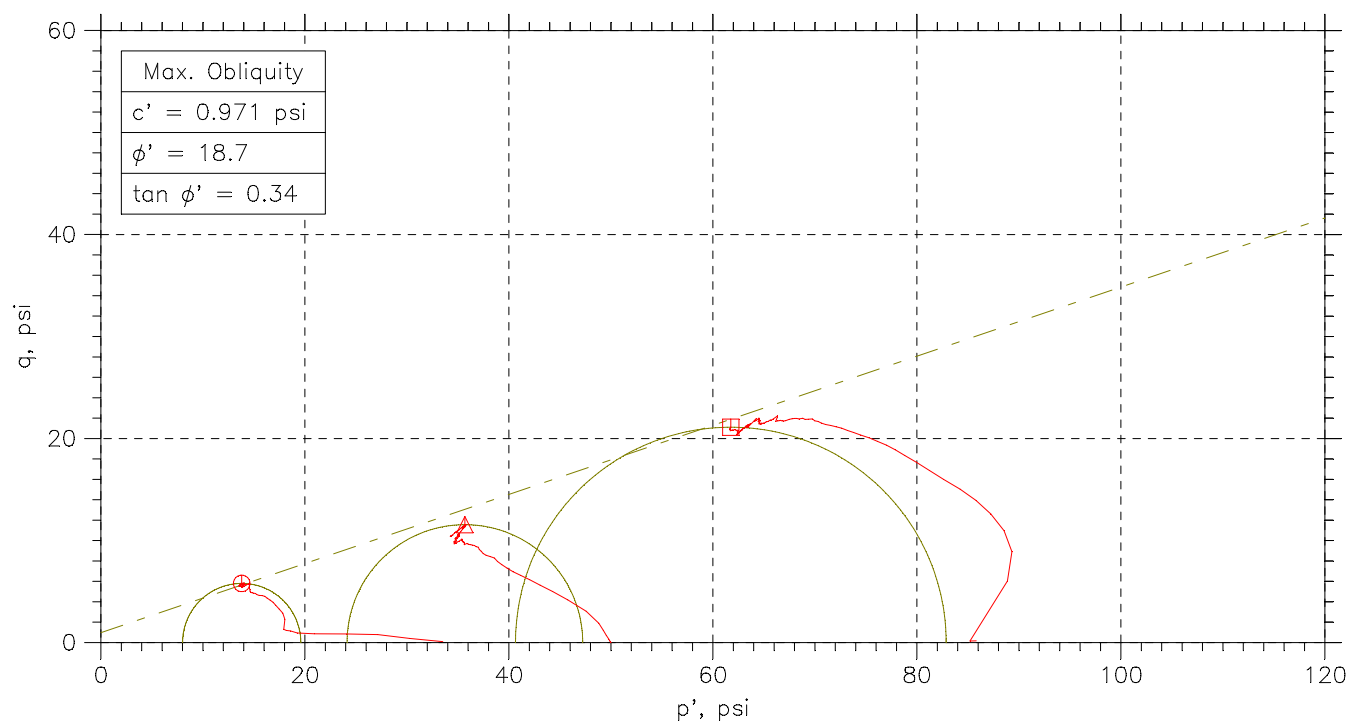


Project: Purple Line				
Location: College Park, MD				
Project No.: 14961-0				
Boring No.: CP-2A				
Sample Type: Pitcher				
Description: Dark Reddish Brown CLAY. (CH)				
Remarks: MATERIAL WAS DISTURBED.				

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

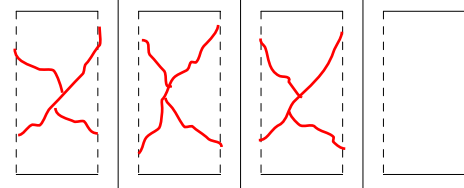
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol	⊙	△	□	
Sample No.	P-4	P-4	P-4	
Test No.	1	2	3	
Depth	78.5'	78'	77.5'	
Initial	Diameter, in	2.856	2.862	2.862
	Height, in	6.089	5.971	5.971
	Water Content, %	36.8	37.1	35.3
	Dry Density, pcf	83.12	86.16	87.29
	Saturation, %	96.8	104.7	102.5
Before Shear	Void Ratio	1.03	0.956	0.931
	Water Content, %	29.0	24.9	24.8
	Dry Density, pcf	94.57	100.9	100.9
	Saturation*, %	100.1	100.0	100.0
	Void Ratio	0.782	0.671	0.67
	Back Press., psi		88.03	
	Ver. Eff. Cons. Stress, psi		49.96	125.
	Shear Strength, psi	5.841	11.57	22.22
	Strain at Failure, %	4.38	9.85	4.39
	Strain Rate, %/min	0.04	0.04	0.04
	B-Value	0.97		
	Estimated Specific Gravity	2.7	2.7	2.7
	Liquid Limit	63	63	63
	Plastic Limit	25	25	25

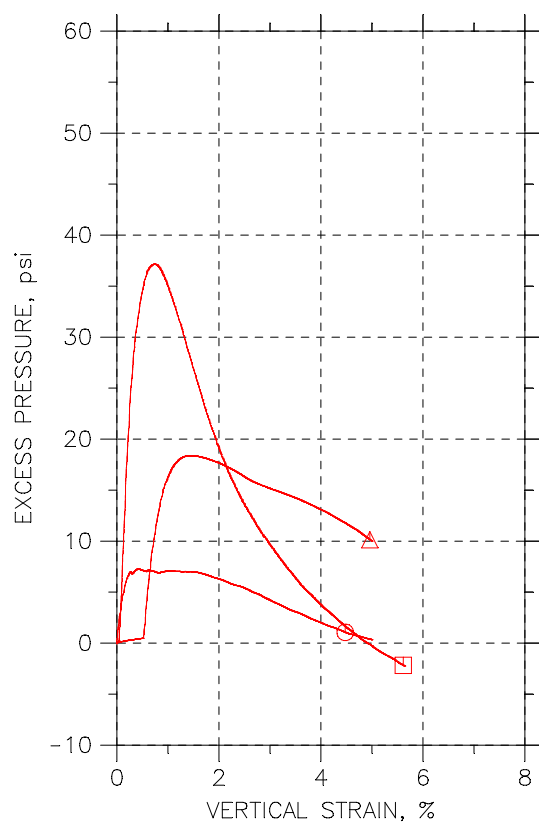
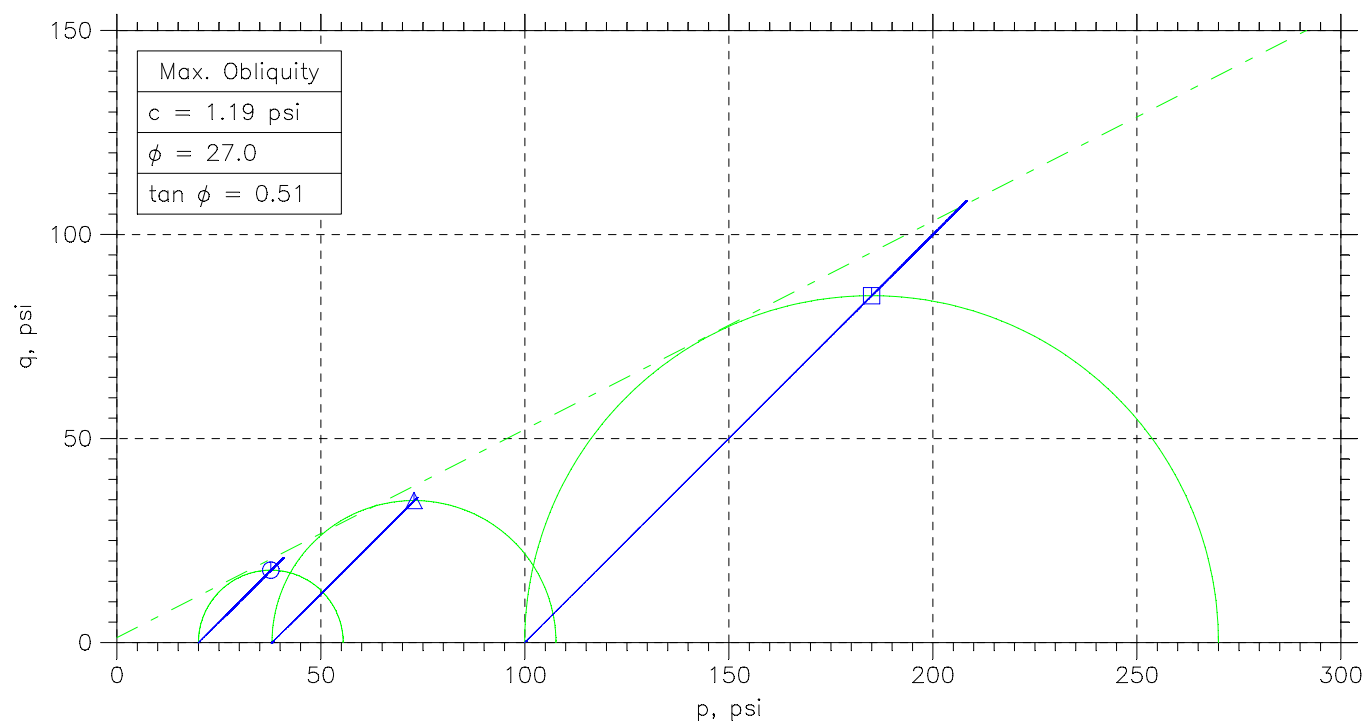


Project: Purple Line
Location: College Park, MD
Project No.: 14961-0
Boring No.: CP-2A
Sample Type: Pitcher
Description: Dark Reddish Brown CLAY. (CH)
Remarks: MATERIAL WAS DISTURBED.




Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	△	□	
Sample No.		P-2	P-2	P-2	
Test No.		1	2	3	
Depth		52.5	52.	51.5	
Initial	Diameter, in	2.015	2.034	2.026	
	Height, in	4.03	4.015	4.015	
	Water Content, %	13.3	16.4	13.9	
	Dry Density, pcf	118.9	111.2	117.4	
	Saturation, %	86.2	86.1	86.4	
Before Shear	Void Ratio	0.418	0.516	0.436	
	Water Content, %	11.6	19.1	13.3	
	Dry Density, pcf	128.4	111.3	124.1	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.313	0.514	0.359	
Back Press., psi		114.	94.01	48.81	
Ver. Eff. Cons. Stress, psi		20.02	37.98	99.99	
Shear Strength, psi		20.77	35.54	108.3	
Strain at Failure, %		4.48	4.96	5.61	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.96	0.96	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		37	37	37	
Plastic Limit		17	17	17	

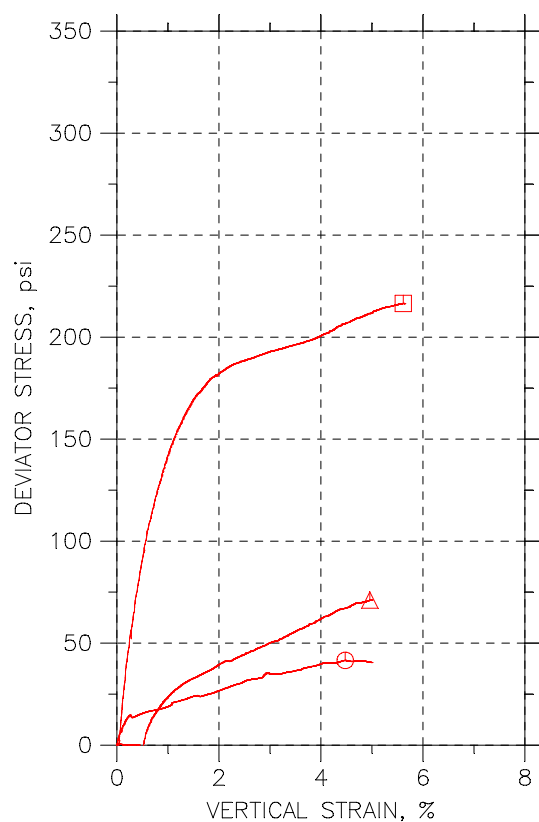
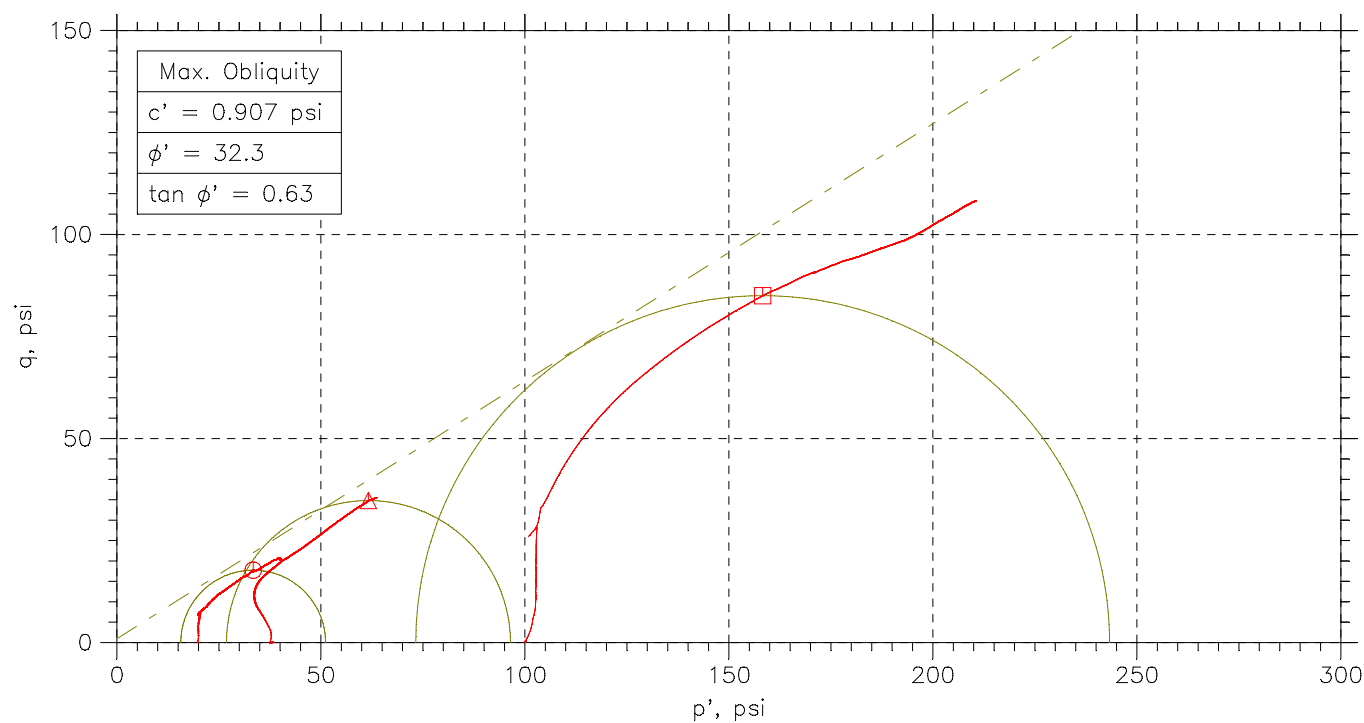


Project: Purple Line	
Location: College Park, MD	
Project No.: 14961-0	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Gray, Medium Stiff to Soft CLAY with Fine Sand lenses. (CL)	
Remarks:	

Phase calculations based on start and end of test.


* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	△	□	
Sample No.		P-2	P-2	P-2	
Test No.		1	2	3	
Depth		52.5	52.	51.5	
Initial	Diameter, in	2.015	2.034	2.026	
	Height, in	4.03	4.015	4.015	
	Water Content, %	13.3	16.4	13.9	
	Dry Density, pcf	118.9	111.2	117.4	
	Saturation, %	86.2	86.1	86.4	
Before Shear	Void Ratio	0.418	0.516	0.436	
	Water Content, %	11.6	19.1	13.3	
	Dry Density, pcf	128.4	111.3	124.1	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.313	0.514	0.359	
Back Press., psi		114.	94.01	48.81	
Ver. Eff. Cons. Stress, psi		20.02	37.98	99.99	
Shear Strength, psi		20.77	35.54	108.3	
Strain at Failure, %		4.48	4.96	5.61	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.96	0.96	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		37	37	37	
Plastic Limit		17	17	17	

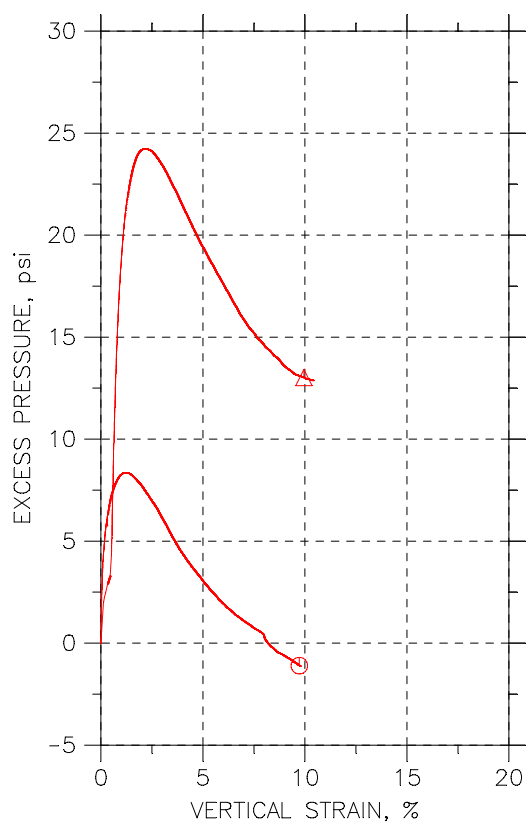
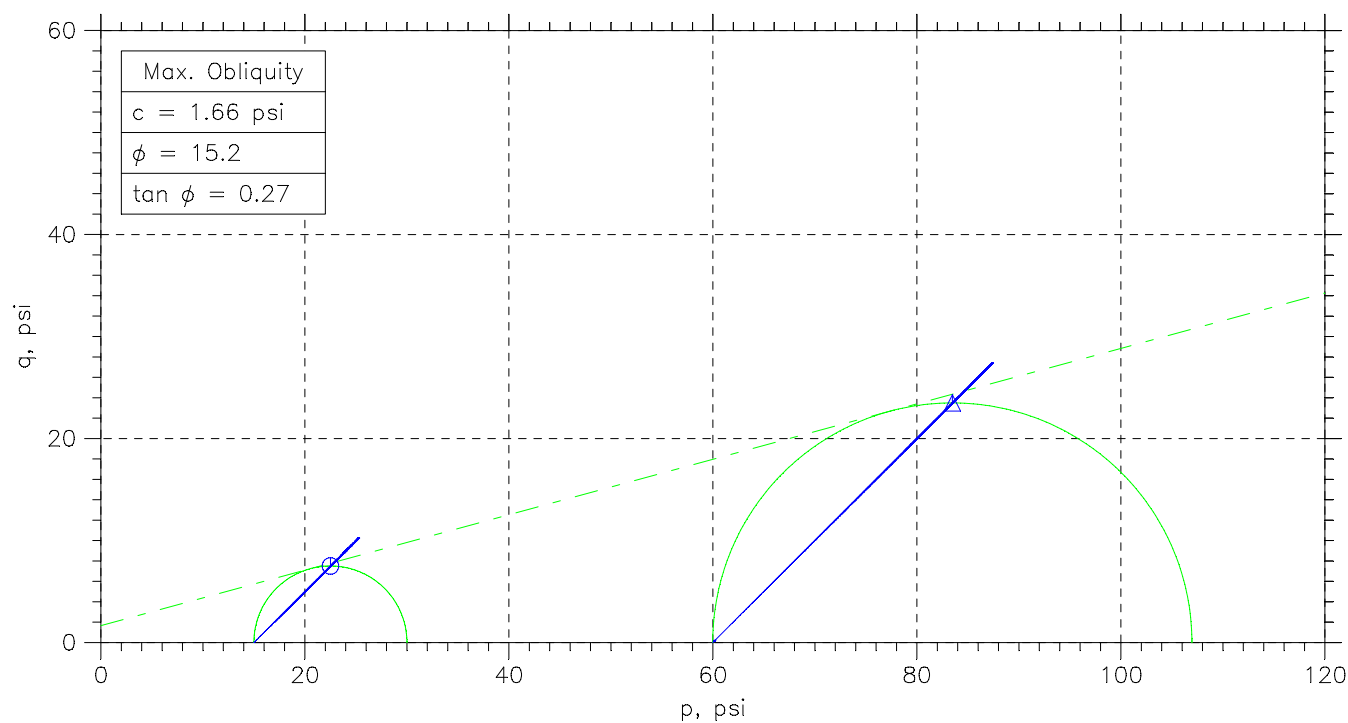


Project: Purple Line	
Location: College Park, MD	
Project No.: 14961-0	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Gray, Medium Stiff to Soft CLAY with Fine Sand lenses. (CL)	
Remarks:	

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊖	Δ		
Sample No.		P-2	P-2		
Test No.		1	2		
Depth		43	43.5		
Initial	Diameter, in	2.861	2.852		
	Height, in	5.753	6.001		
	Water Content, %	19.2	21.0		
	Dry Density, pcf	106.	108.1		
	Saturation, %	87.6	101.5		
Before Shear	Void Ratio	0.59	0.559		
	Water Content, %	24.9	21.2		
	Dry Density, pcf	100.8	107.2		
	Saturation*, %	100.0	100.0		
	Void Ratio	0.672	0.573		
	Back Press., psi	124.	83.86		
	Ver. Eff. Cons. Stress, psi	14.97	60.13		
	Shear Strength, psi	10.26	27.43		
	Strain at Failure, %	9.73	9.95		
	Strain Rate, %/min	0.04	0.04		
B-Value					
Estimated Specific Gravity		2.7	2.7		
Liquid Limit		49	49		
Plastic Limit		21	21		

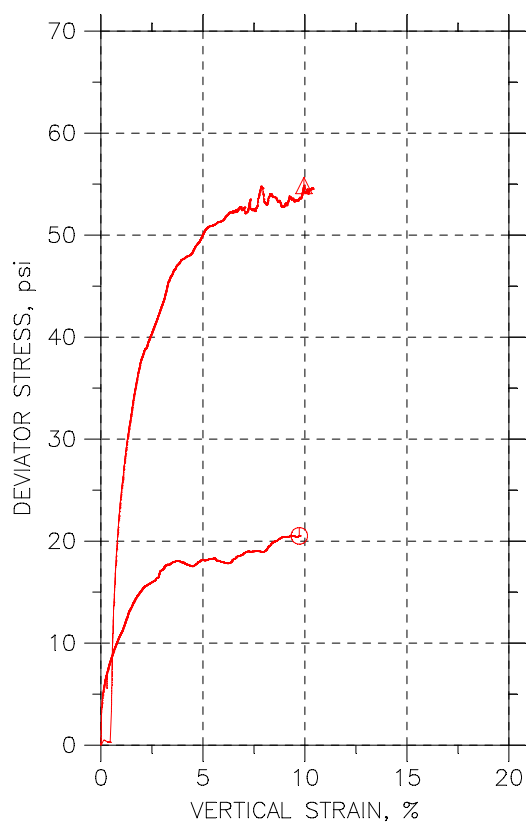
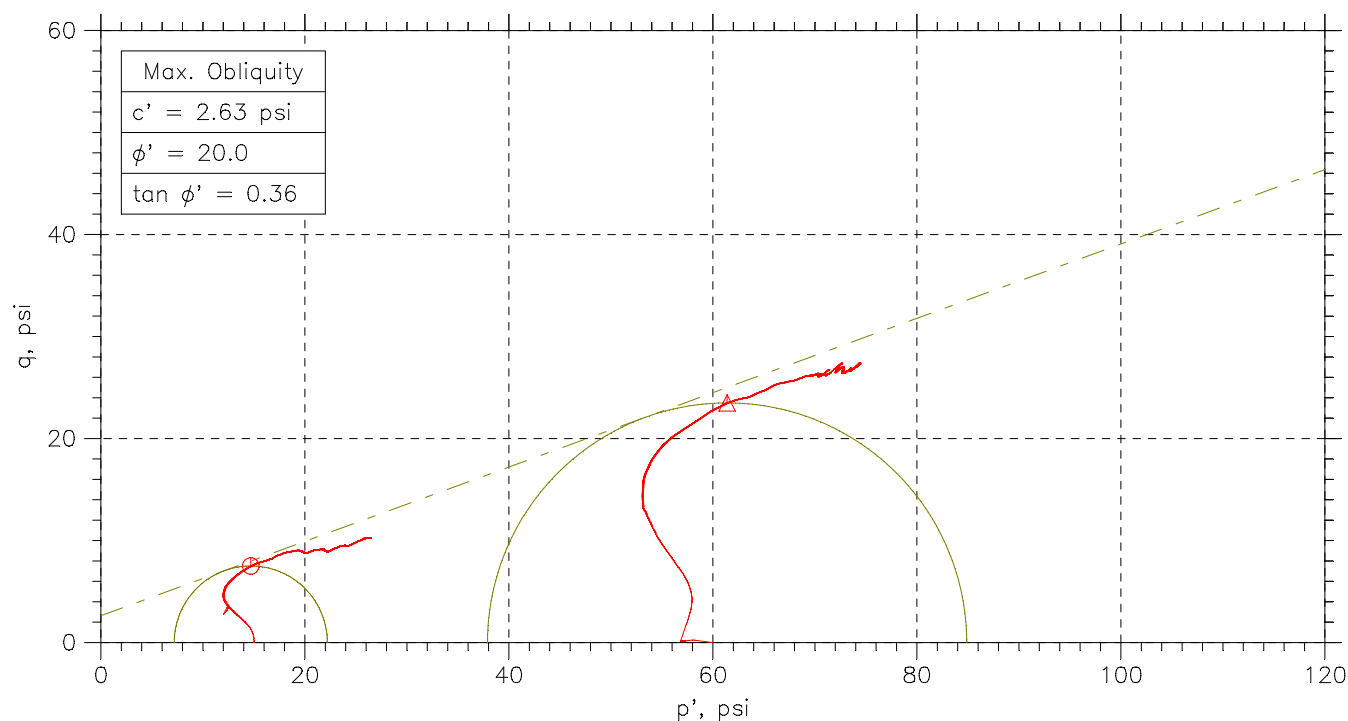


Project: Purple Line				
Location: College Park, MD				
Project No.: 14961-0				
Boring No.: CP-4A				
Sample Type: Pitcher				
Description: Mottled Reddish Brown and Yellow CLAY, trace fine Sand. (CL)				
Remarks:				

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊖	Δ		
Sample No.		P-2	P-2		
Test No.		1	2		
Depth		43	43.5		
Initial	Diameter, in	2.861	2.852		
	Height, in	5.753	6.001		
	Water Content, %	19.2	21.0		
	Dry Density, pcf	106.	108.1		
	Saturation, %	87.6	101.5		
Before Shear	Void Ratio	0.59	0.559		
	Water Content, %	24.9	21.2		
	Dry Density, pcf	100.8	107.2		
	Saturation*, %	100.0	100.0		
	Void Ratio	0.672	0.573		
Back Press., psi		124.	83.86		
Ver. Eff. Cons. Stress, psi		14.97	60.13		
Shear Strength, psi		10.26	27.43		
Strain at Failure, %		9.73	9.95		
Strain Rate, %/min		0.04	0.04		
B-Value					
Estimated Specific Gravity		2.7	2.7		
Liquid Limit		49	49		
Plastic Limit		21	21		



Project: Purple Line

Location: College Park, MD

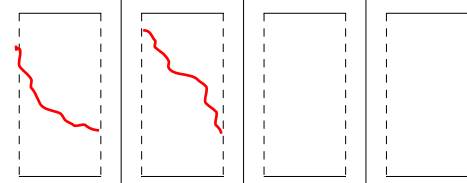
Project No.: 14961-0

Boring No.: CP-4A

Sample Type: Pitcher

Description: Mottled Reddish Brown and Yellow CLAY, trace fine Sand. (CL)

Remarks:



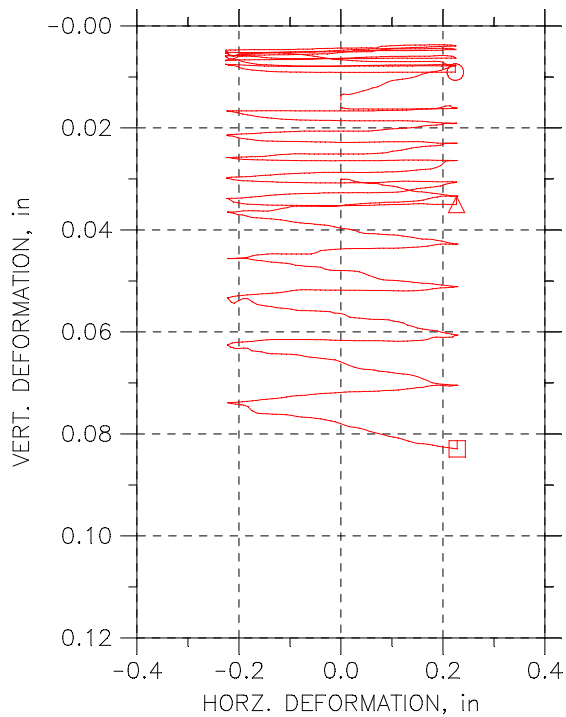
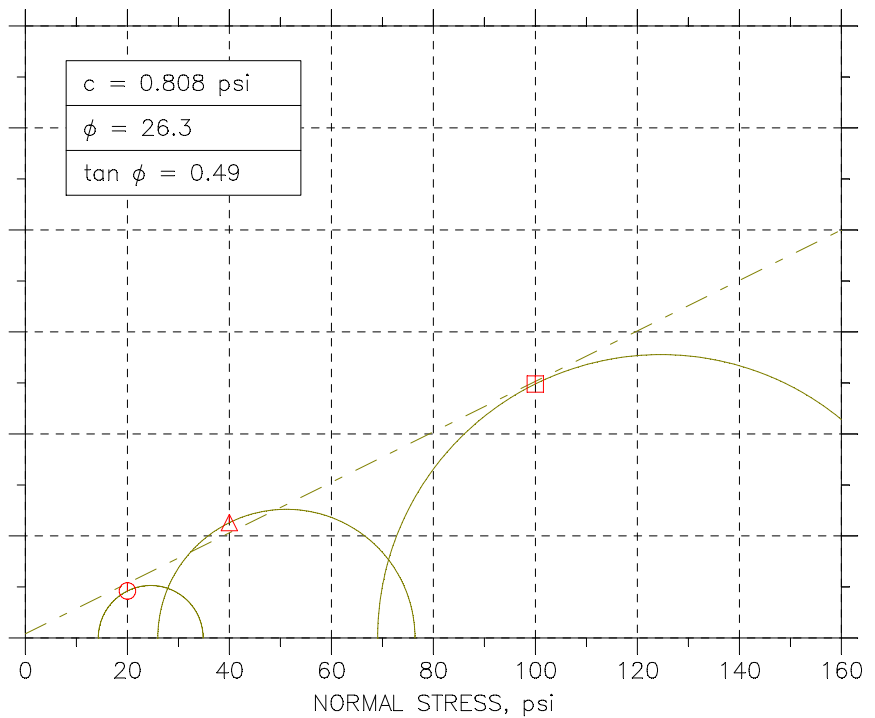
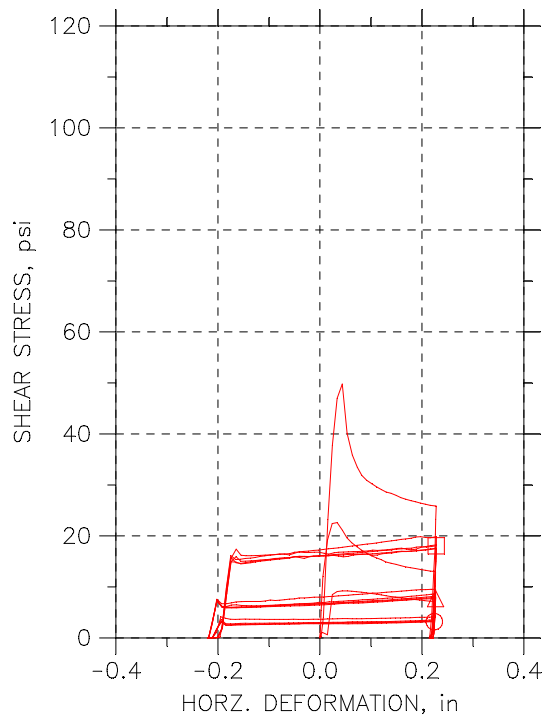
Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.



DIRECT SHEAR TEST RESULTS

DIRECT SHEAR TEST REPORT



Symbol	○	Δ	□	
Test No.	A-1	A-2	A-3	
Sample No.	P-3	P-3	P-3	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	22.02	20.62	23.23
	Dry Density, pcf	107.74	109.54	109.56
	Saturation, %	105.33	103.34	116.48
	Void Ratio	0.56445	0.5388	0.53844
Consol. Height, in		0.98548	0.98396	0.96995
Consol. Void Ratio		0.54173	0.51412	0.49221
Final	Water Content, %	22.45	22.04	21.09
	Dry Density, pcf	108.73	113.51	119.47
	Saturation, %	110.15	122.72	138.62
	Void Ratio	0.55028	0.48491	0.41084
Normal Stress, psi		20.007	39.988	99.975
Max. Shear Stress, psi		9.2084	22.599	49.785
Shear Stress, psi		3.1882	7.7179	18.053
Time to Failure, min		6.0035	4.0038	5.0038
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		65	65	65
Plastic Limit		28	28	28
Plasticity Index		37	37	37

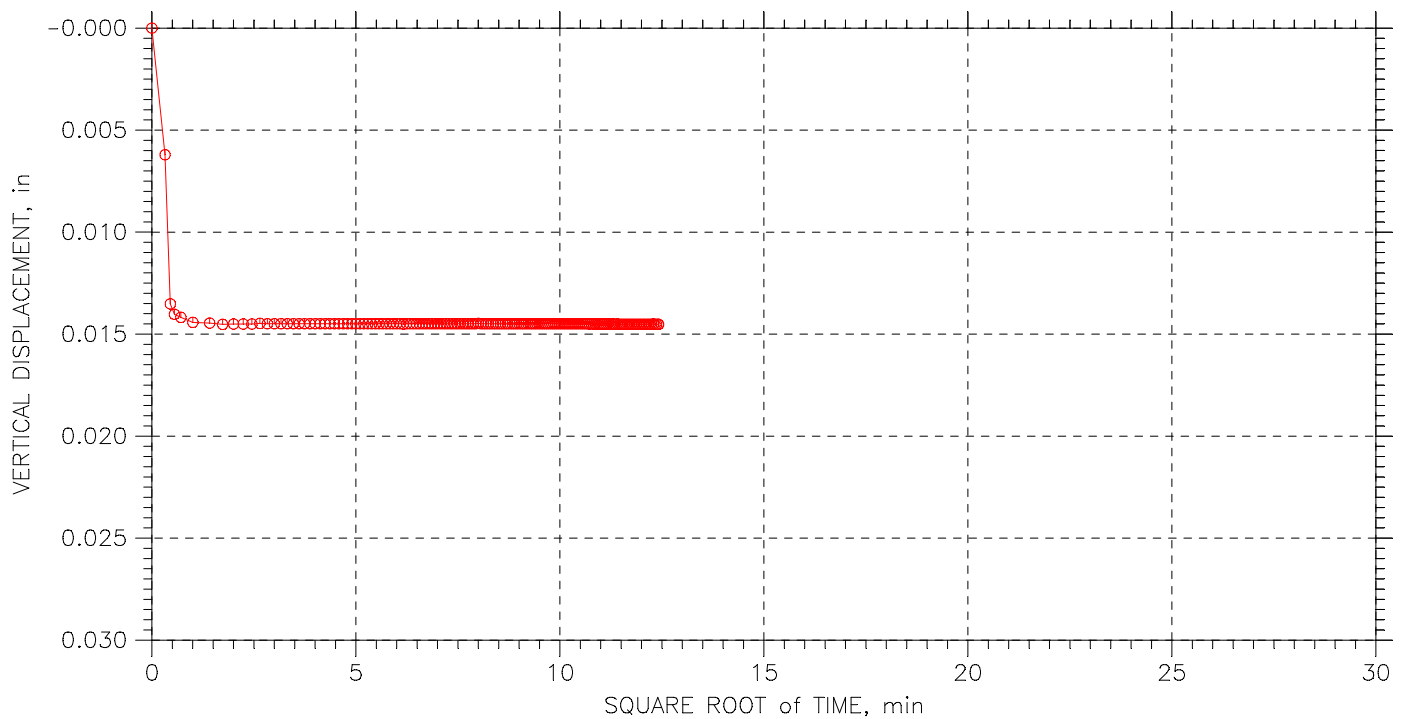
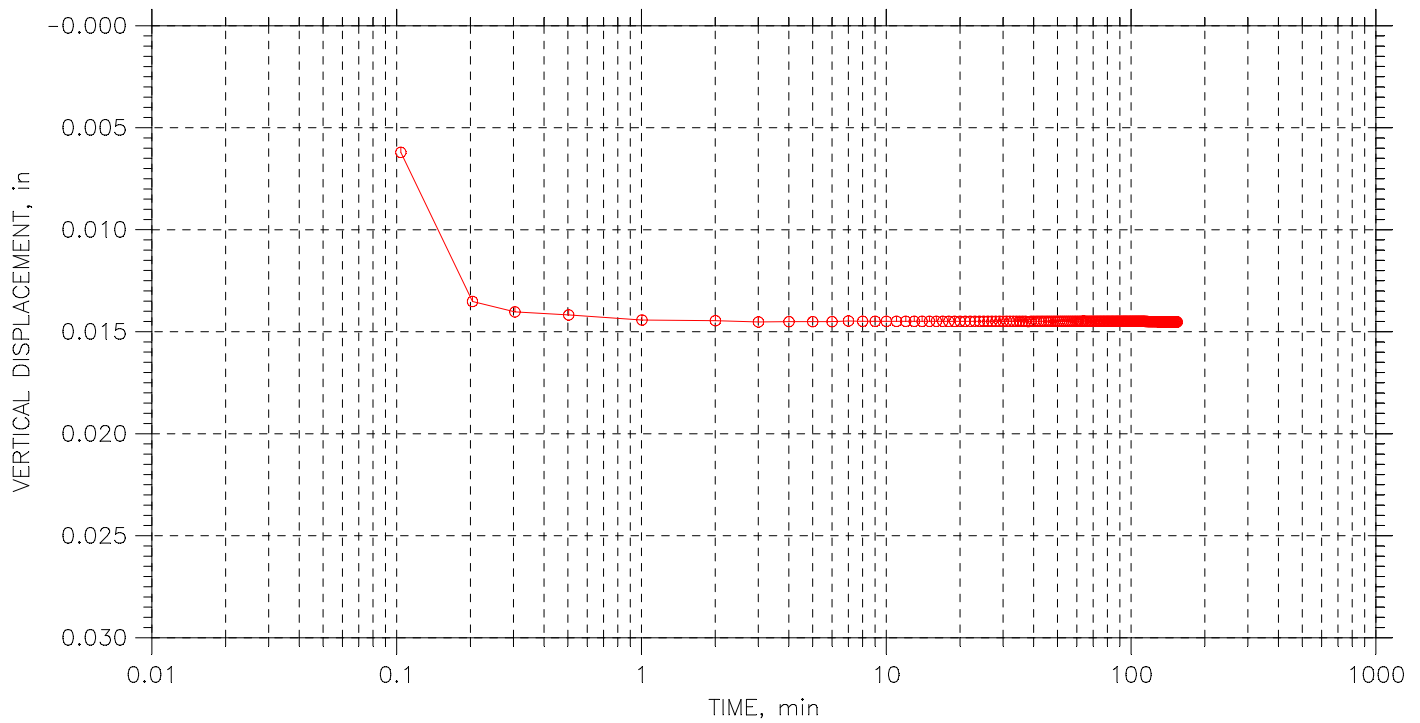
Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Stiff Clay trace fine Sand (CH)
 Remarks: Constant Volume (Sample not allowed to swell before testing)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

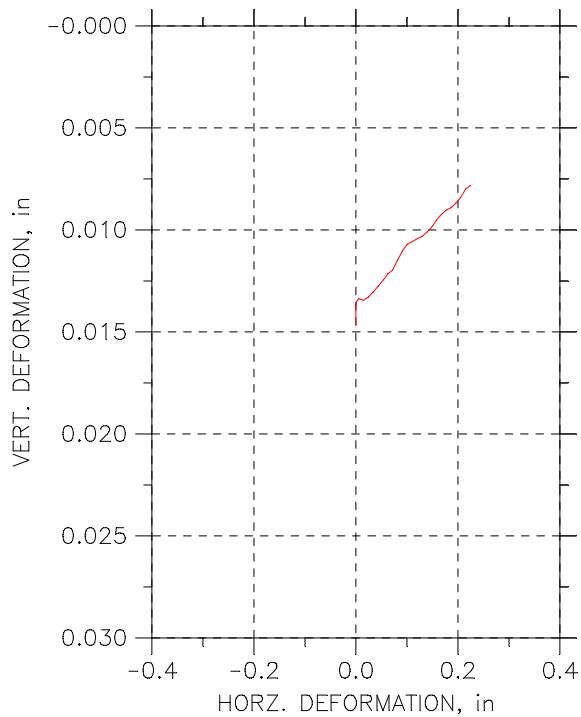
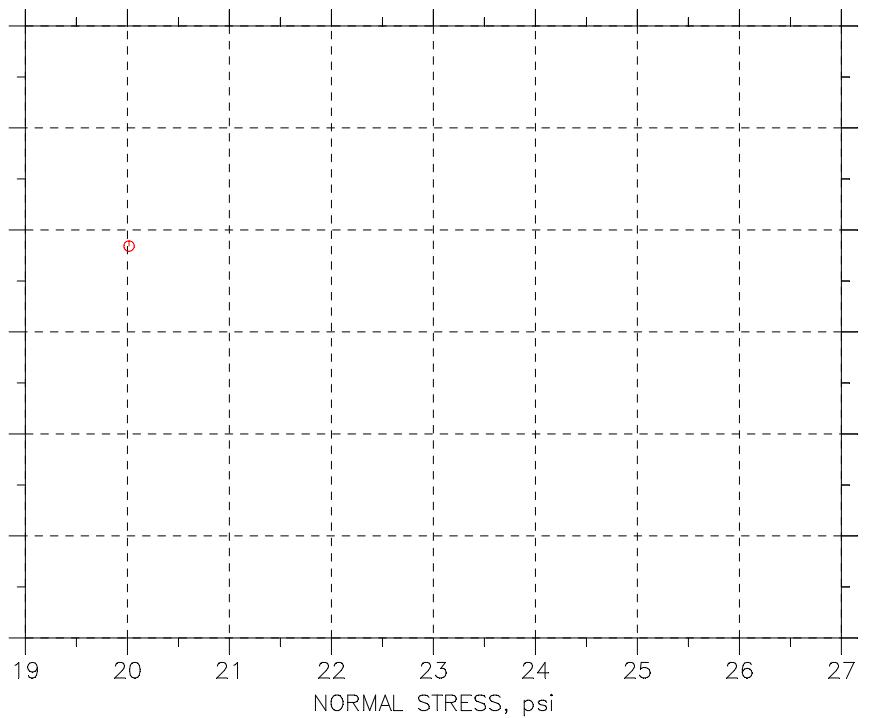
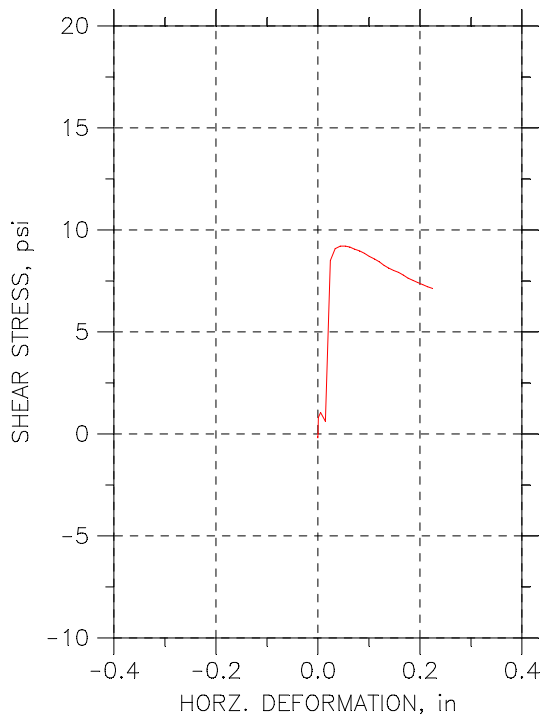
Step: 1 of 1

Stress: 20 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 9/7/07	Depth: 56.3'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Sample not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 20PSI const		

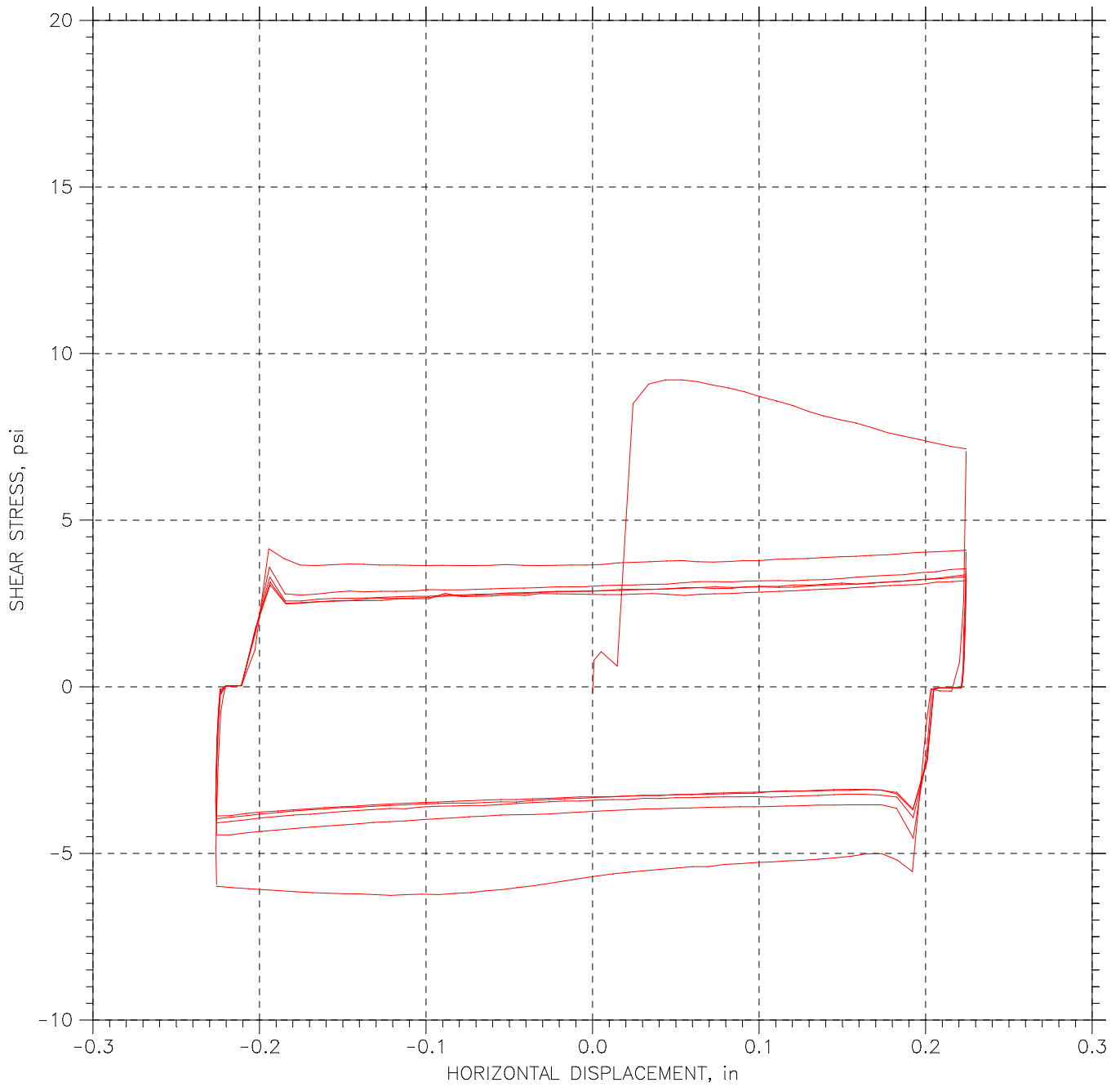
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-1			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	22.02		
	Dry Density, pcf	107.7		
	Saturation, %	105.33		
	Void Ratio	0.56445		
Consol. Height, in		0.98548		
Consol. Void Ratio		0.54173		
Final	Water Content, %	22.45		
	Dry Density, pcf	108.7		
	Saturation, %	110.15		
	Void Ratio	0.55028		
Normal Stress, psi		20.015		
Max. Shear Stress, psi		9.2084		
Res Shear Stress, psi		7.1382		
Time to Failure, min		5.0036		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		65		
Plastic Limit		28		
Plasticity Index		37		

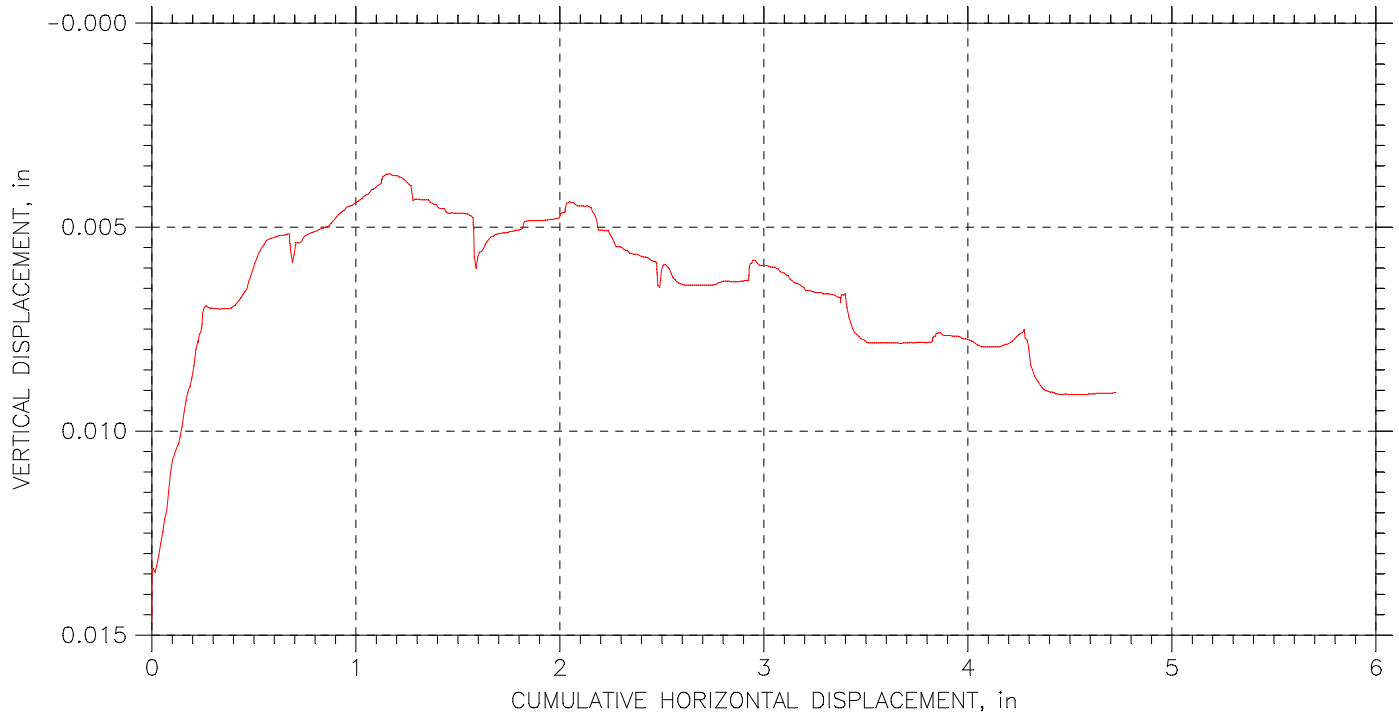
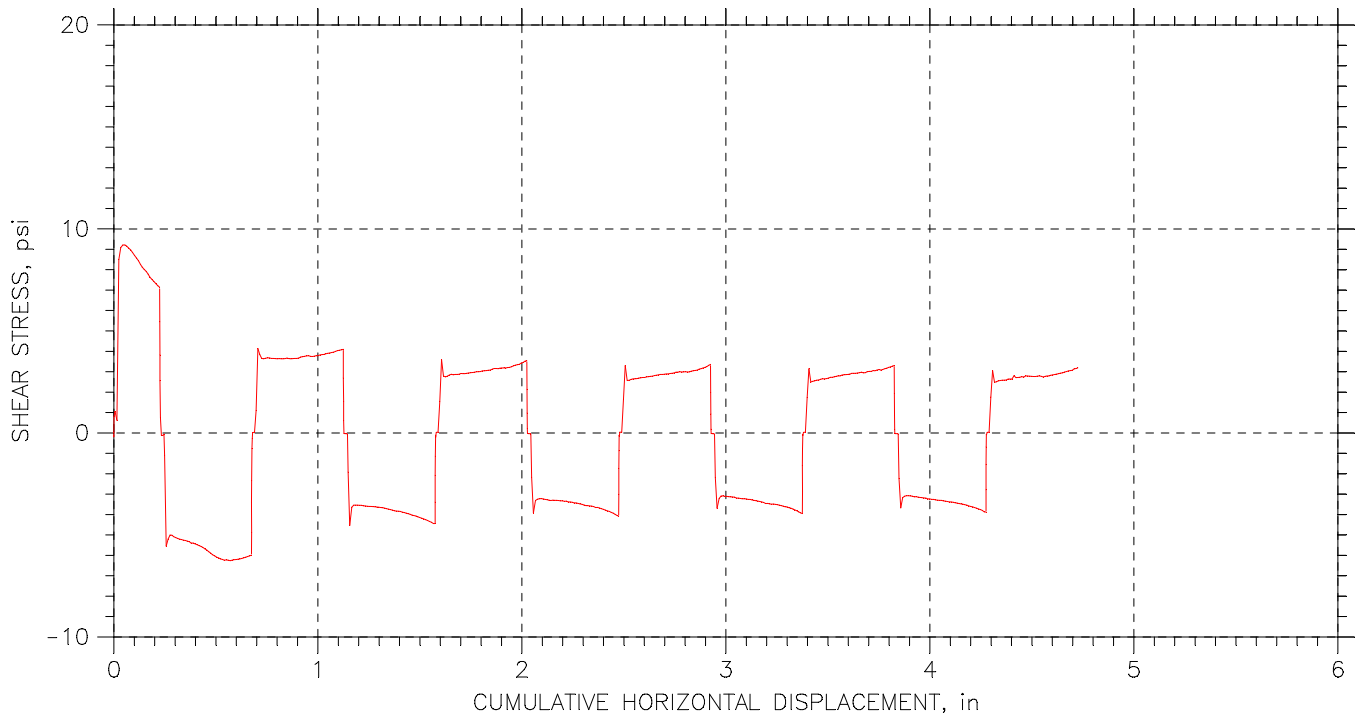
Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Stiff Clay trace fine Sand (CH)
 Remarks: Constant Volume (Sample not allowed to swell before testing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 9/7/07	Depth: 56.3'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Sample not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 20PSI const		

RESIDUAL SHEAR TEST



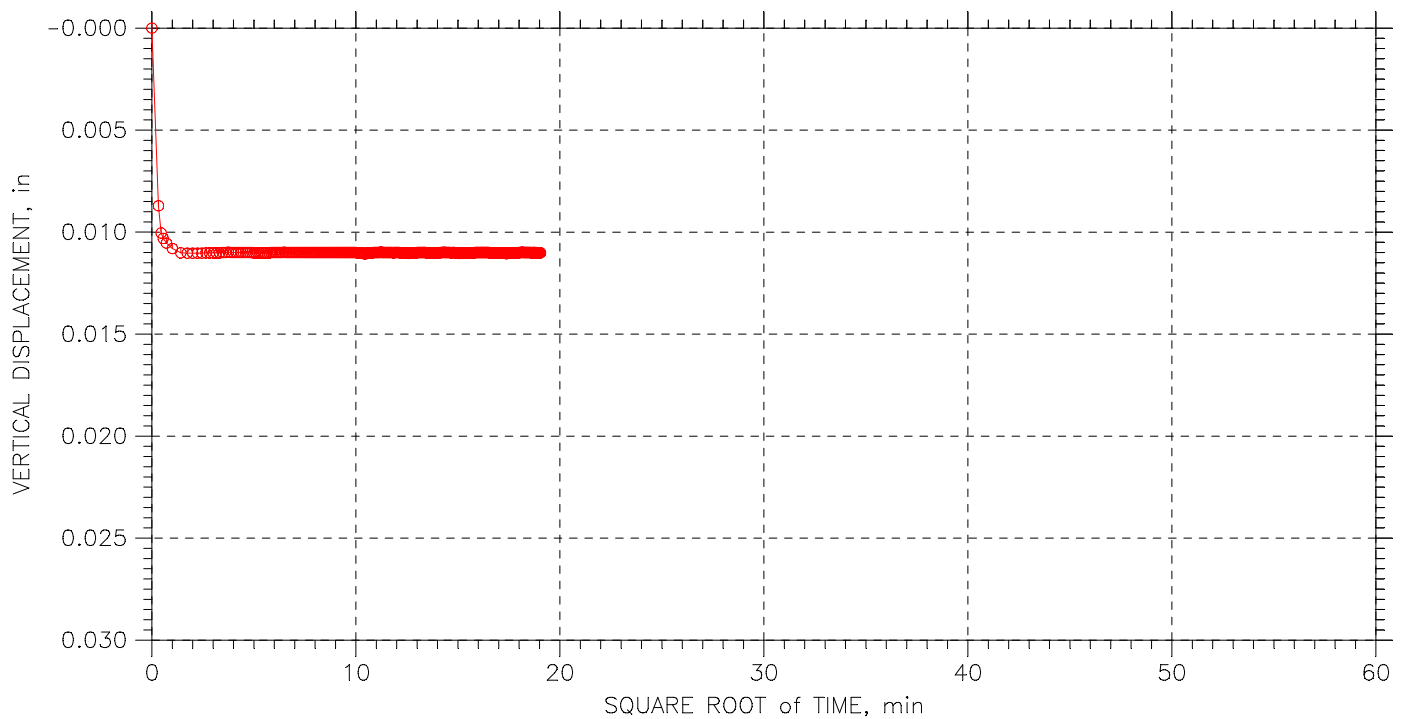
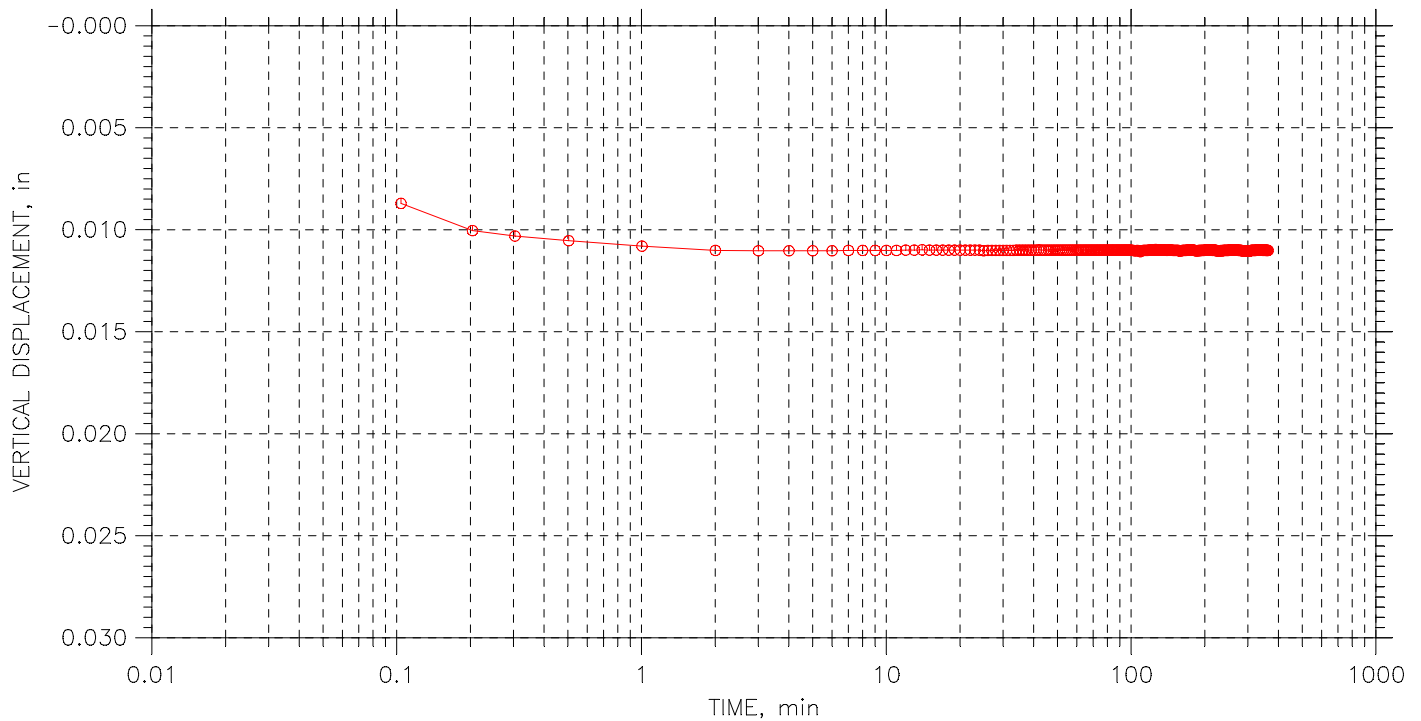
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 9/7/07	Depth: 56.3'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Sample not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 20PSI const		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 2

Stress: 20 psi



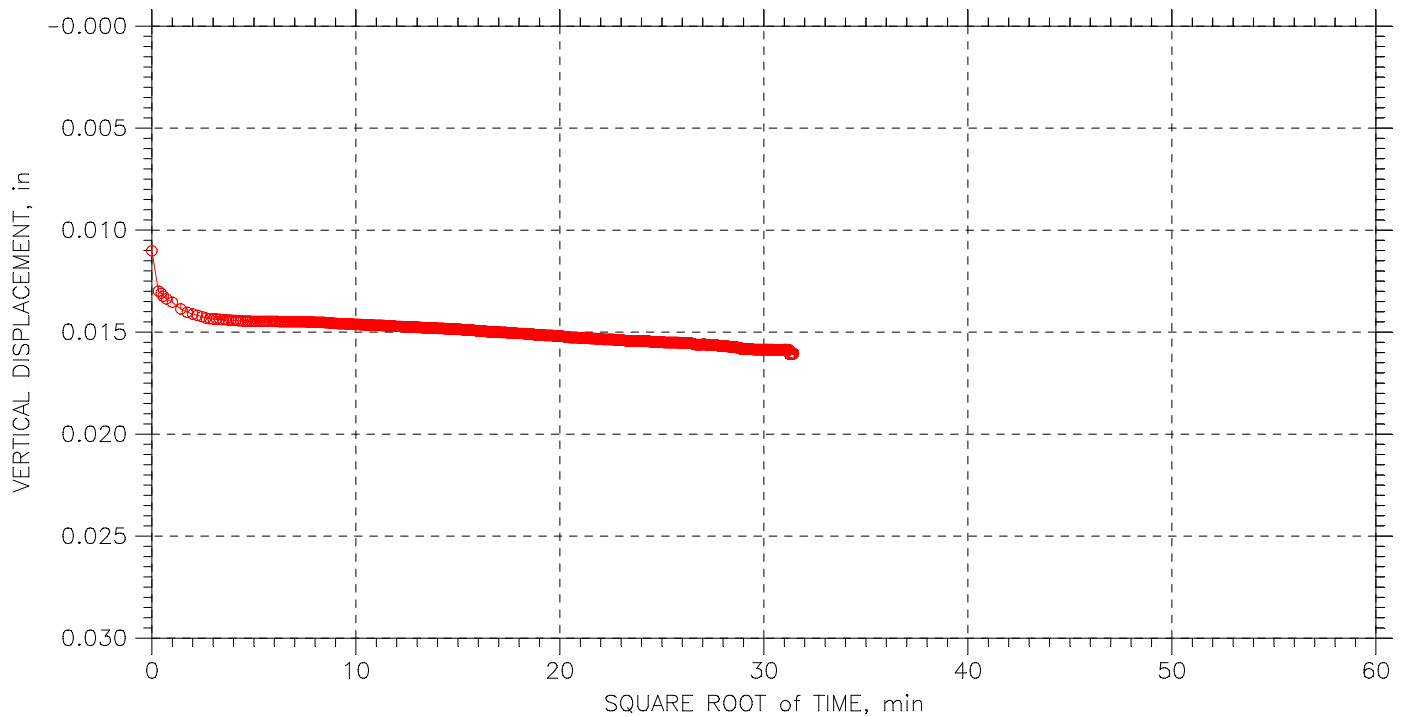
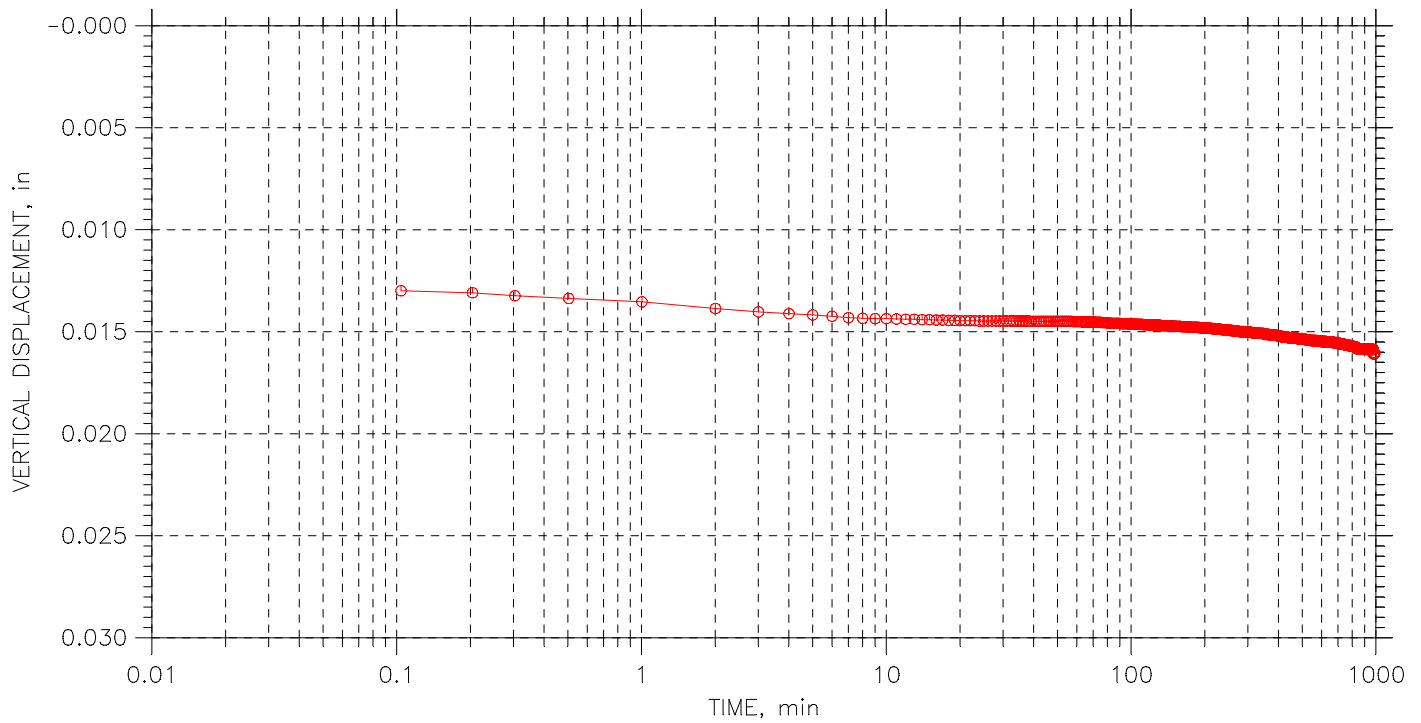
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys	Checked By: Bert
Sample No.: P-3	Test Date: 9/8/07	Depth: 56.5'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
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DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

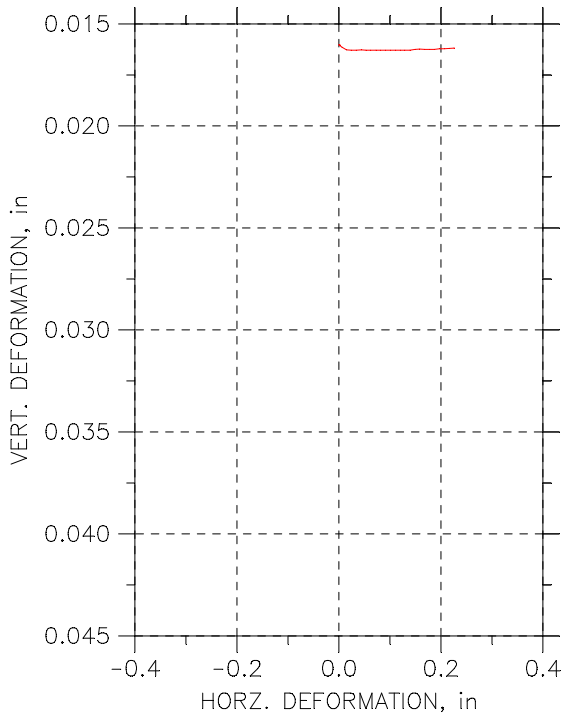
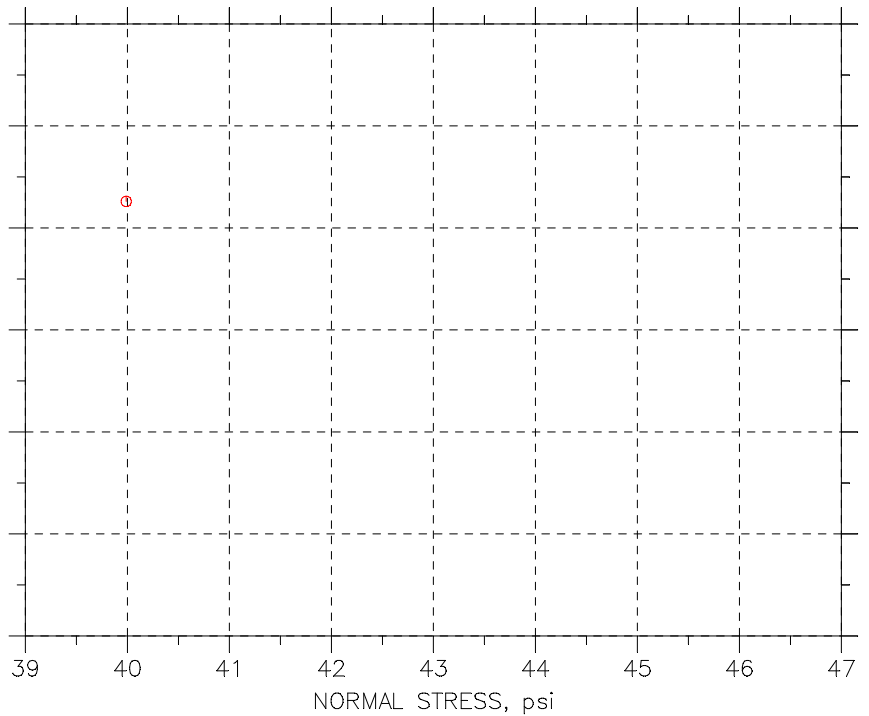
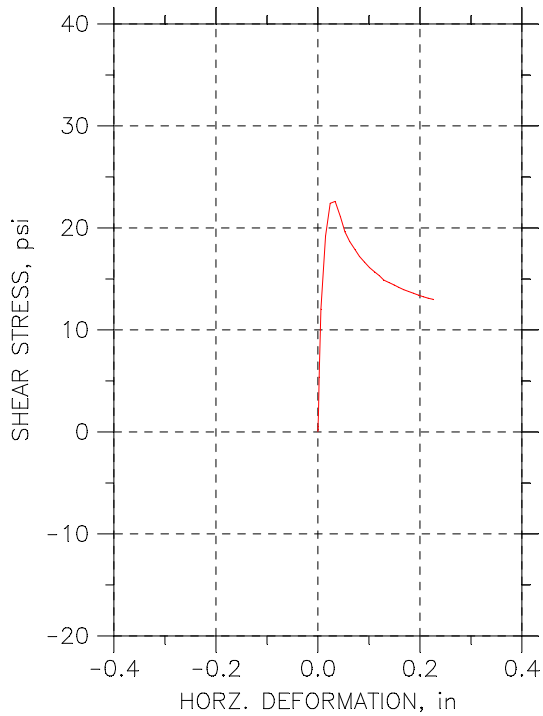
Step: 2 of 2

Stress: 40 psi



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys	Checked By: Bert
Sample No.: P-3	Test Date: 9/8/07	Depth: 56.5'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 40psi consto		

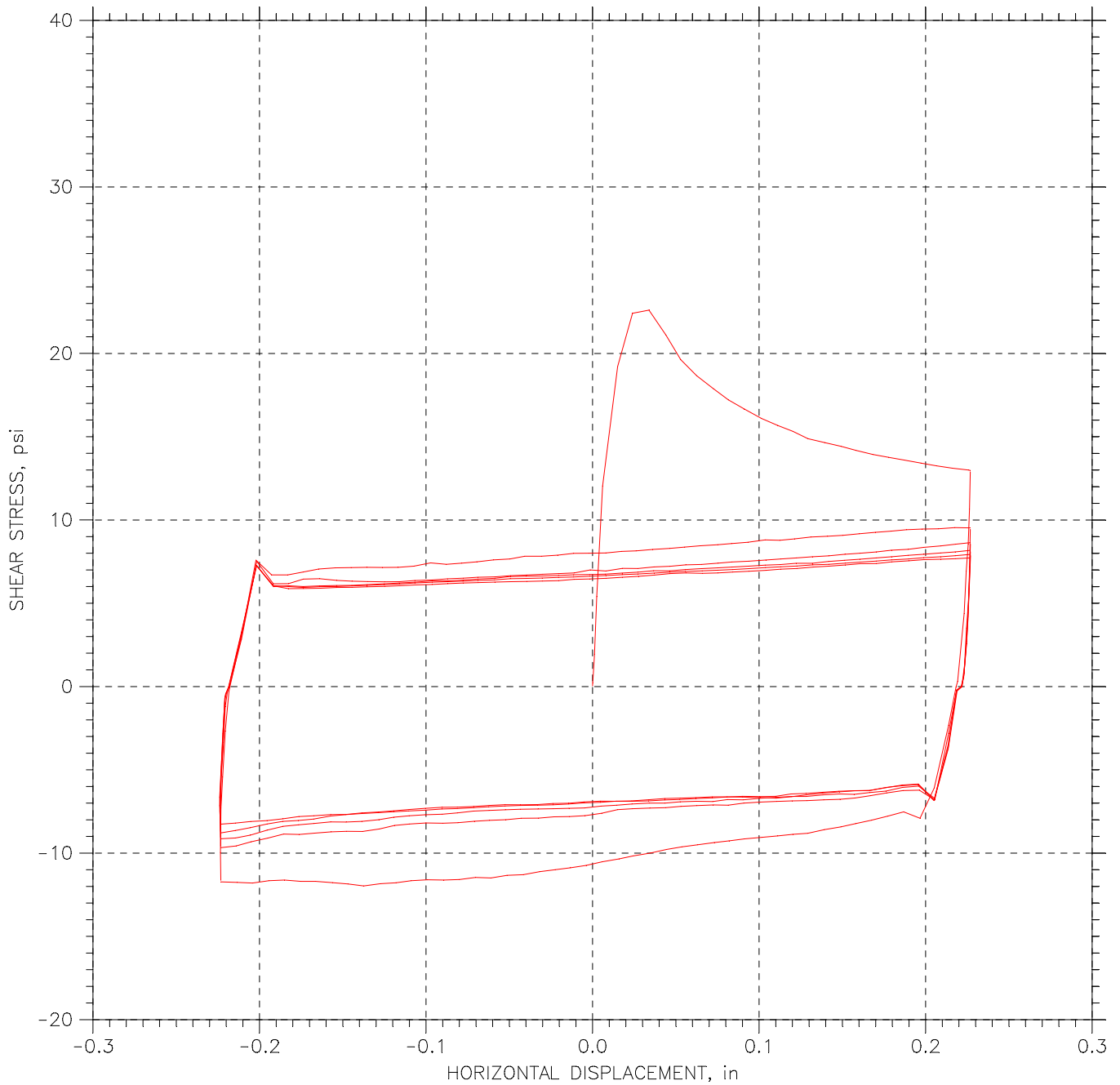
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-2			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	20.62		
	Dry Density, pcf	109.5		
	Saturation, %	103.34		
	Void Ratio	0.5388		
Consol. Height, in		0.98396		
Consol. Void Ratio		0.51412		
Final	Water Content, %	22.04		
	Dry Density, pcf	113.5		
	Saturation, %	122.72		
	Void Ratio	0.48491		
Normal Stress, psi		39.988		
Max. Shear Stress, psi		22.599		
Res Shear Stress, psi		12.976		
Time to Failure, min		4.0038		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		65		
Plastic Limit		28		
Plasticity Index		37		

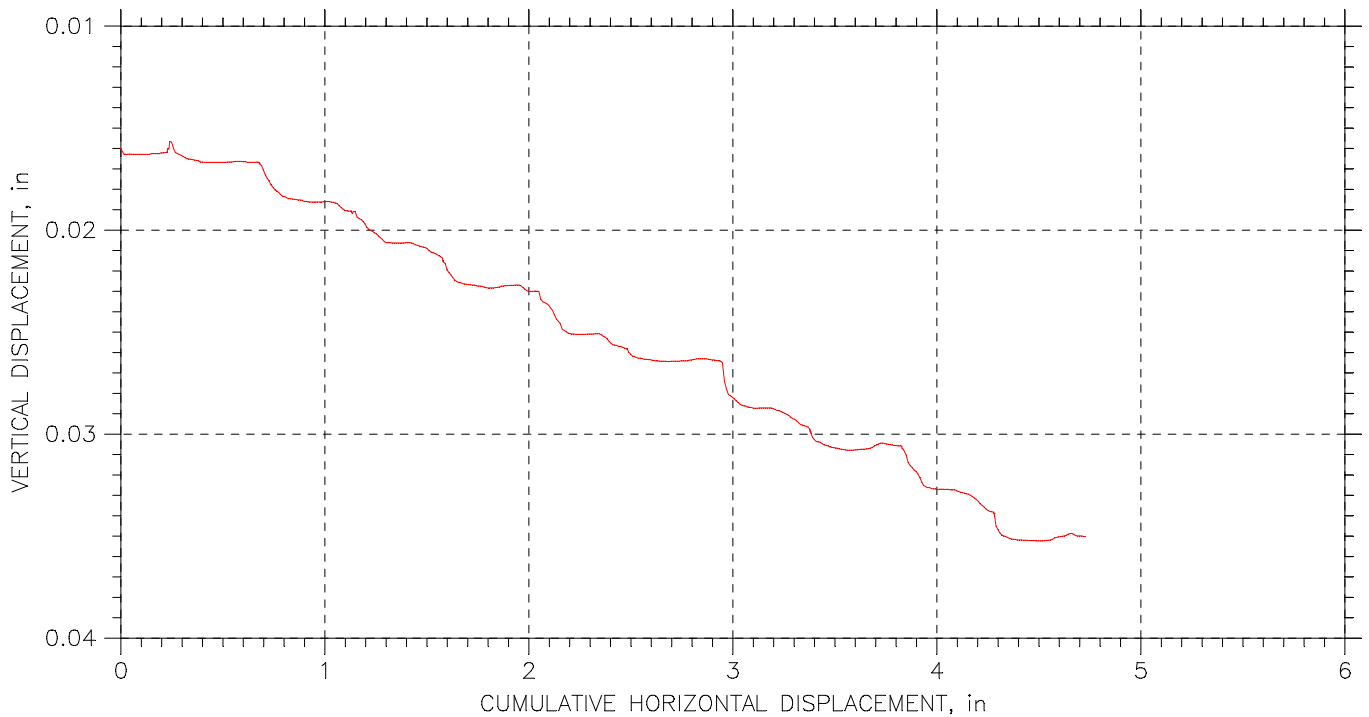
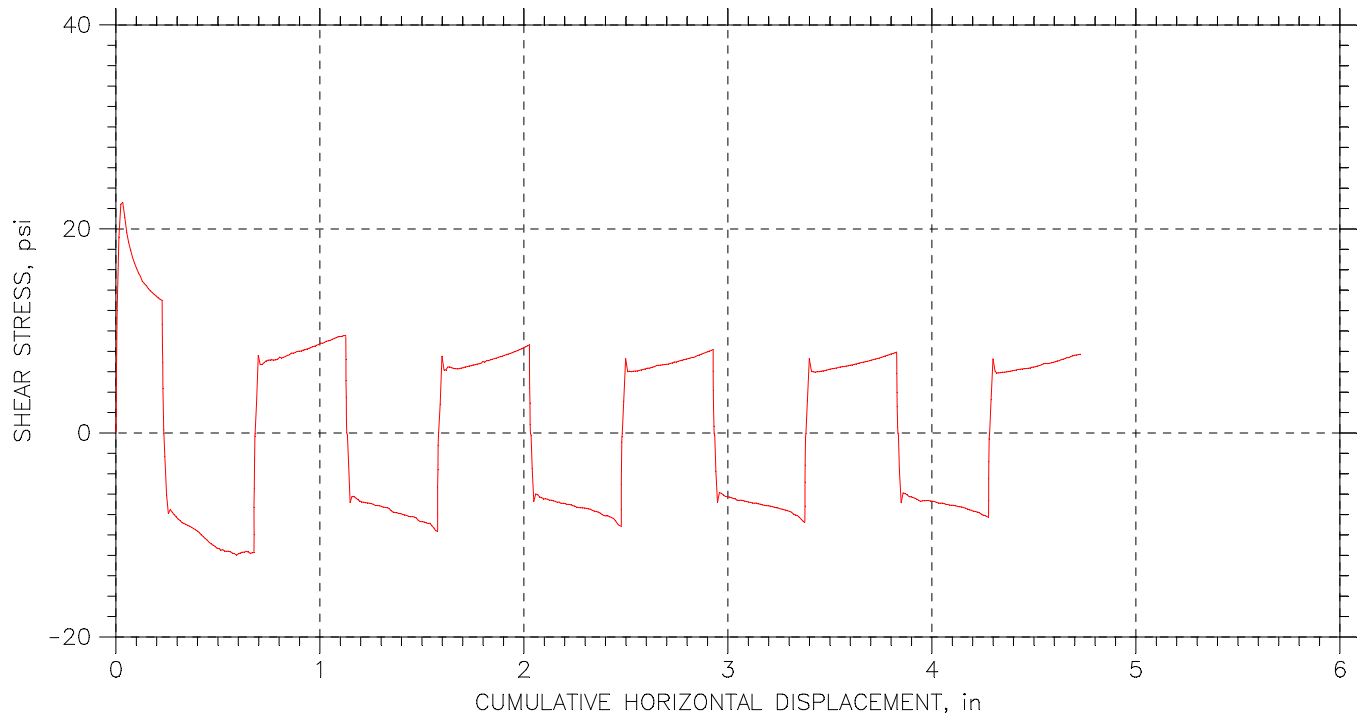
Project: Purple Line
 Location: College Park
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)
 Remarks: Constant Volume (Samples not allowed to swell before testing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys	Checked By: Bert
Sample No.: P-3	Test Date: 9/8/07	Depth: 56.5'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 40psi consto		

RESIDUAL SHEAR TEST



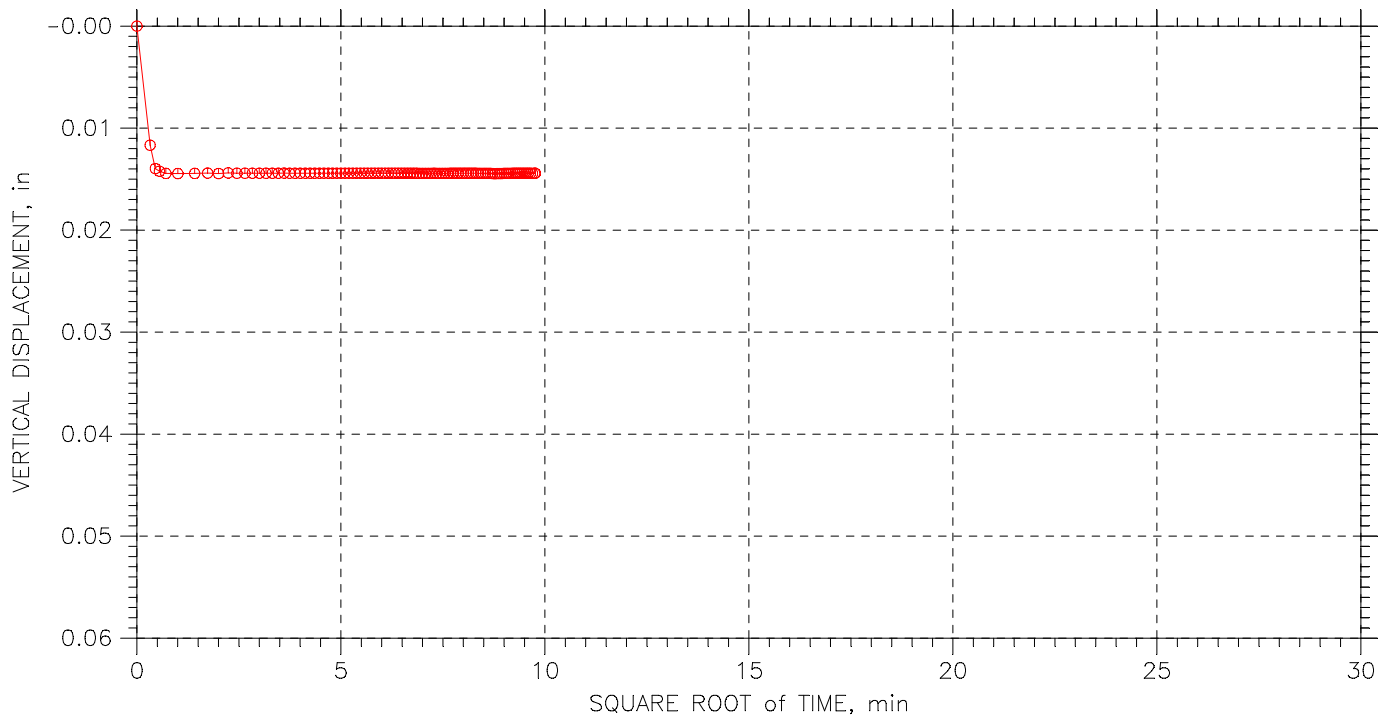
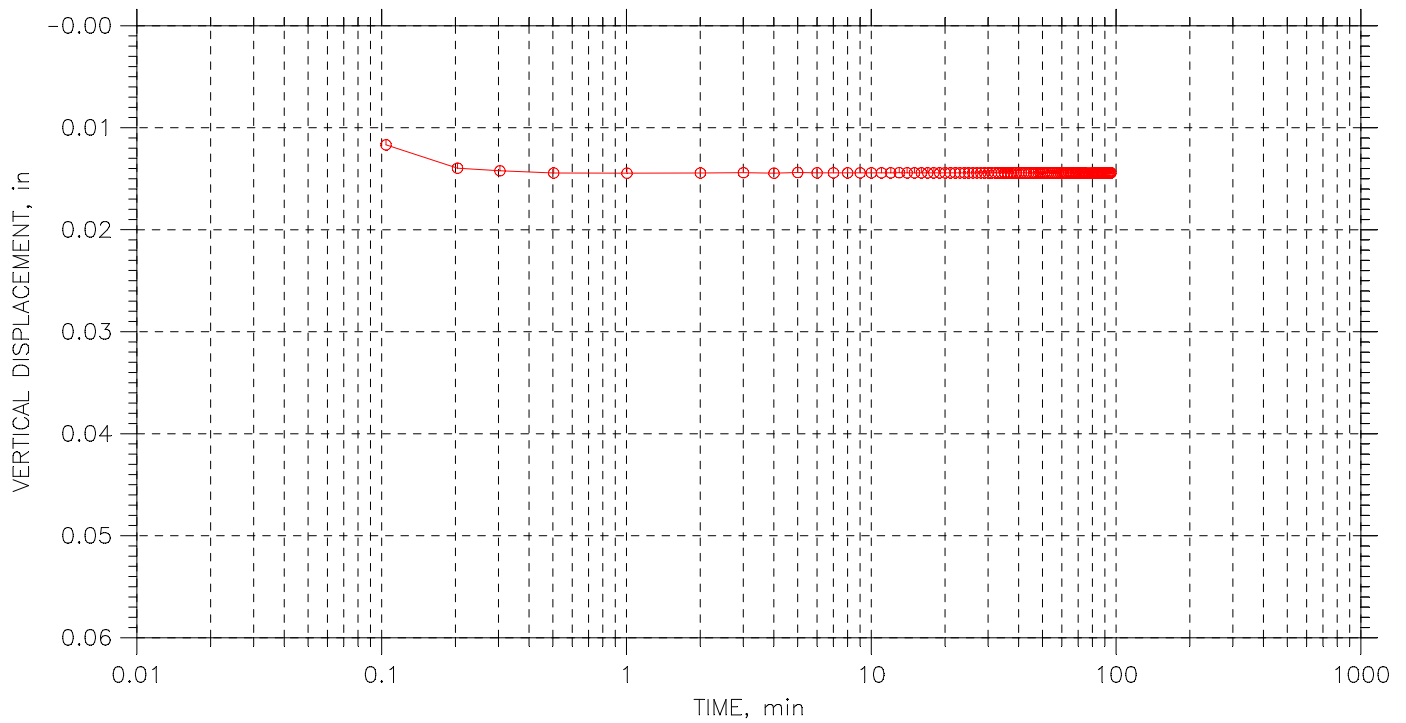
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys	Checked By: Bert
Sample No.: P-3	Test Date: 9/8/07	Depth: 56.5'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 40psi consto		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 3

Stress: 20 psi



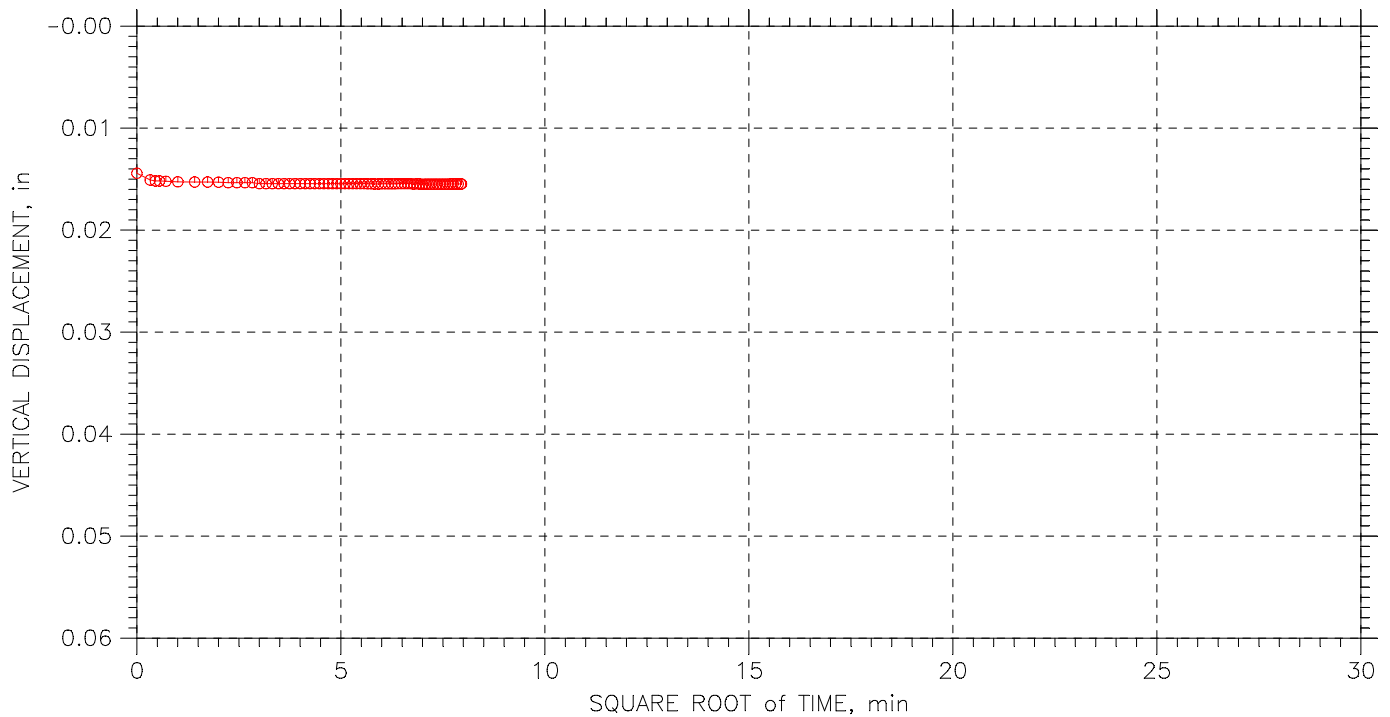
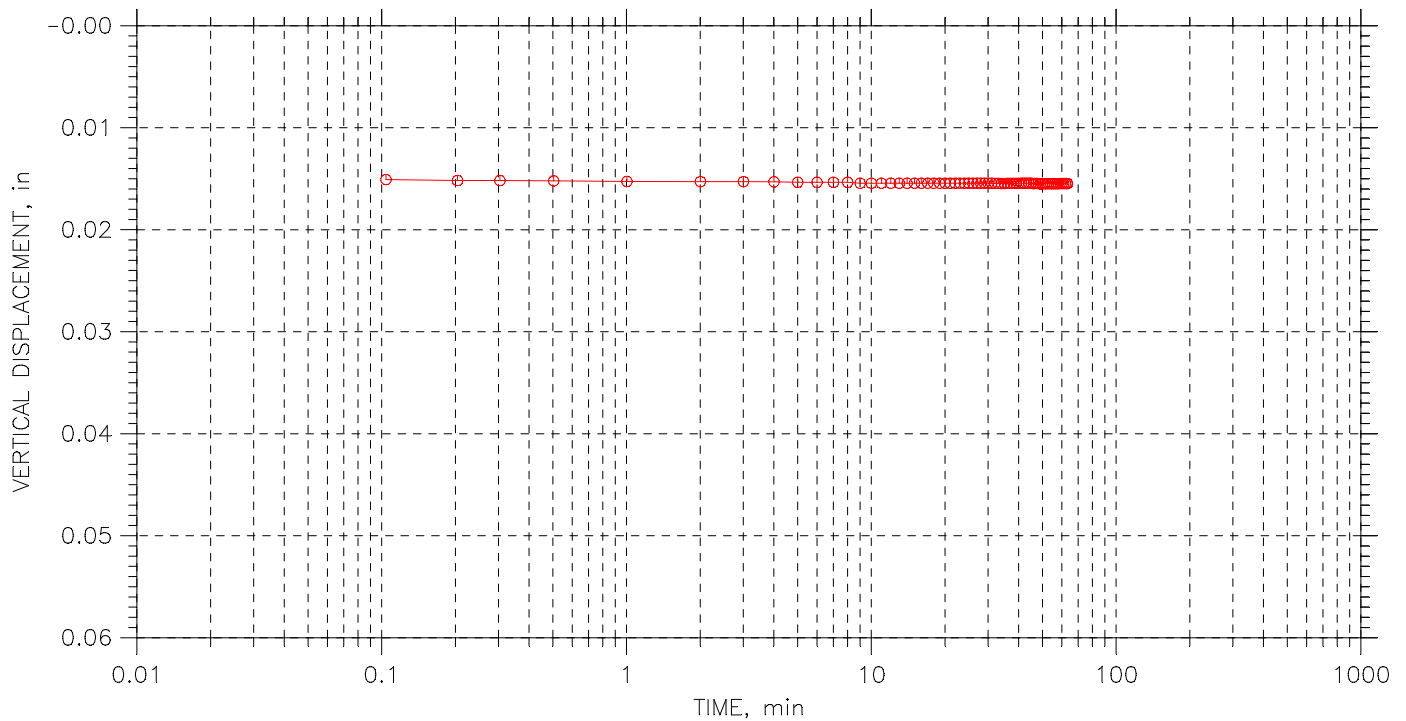
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 9/10/07	Depth: 56.7'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI cons		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 2 of 3

Stress: 40 psi



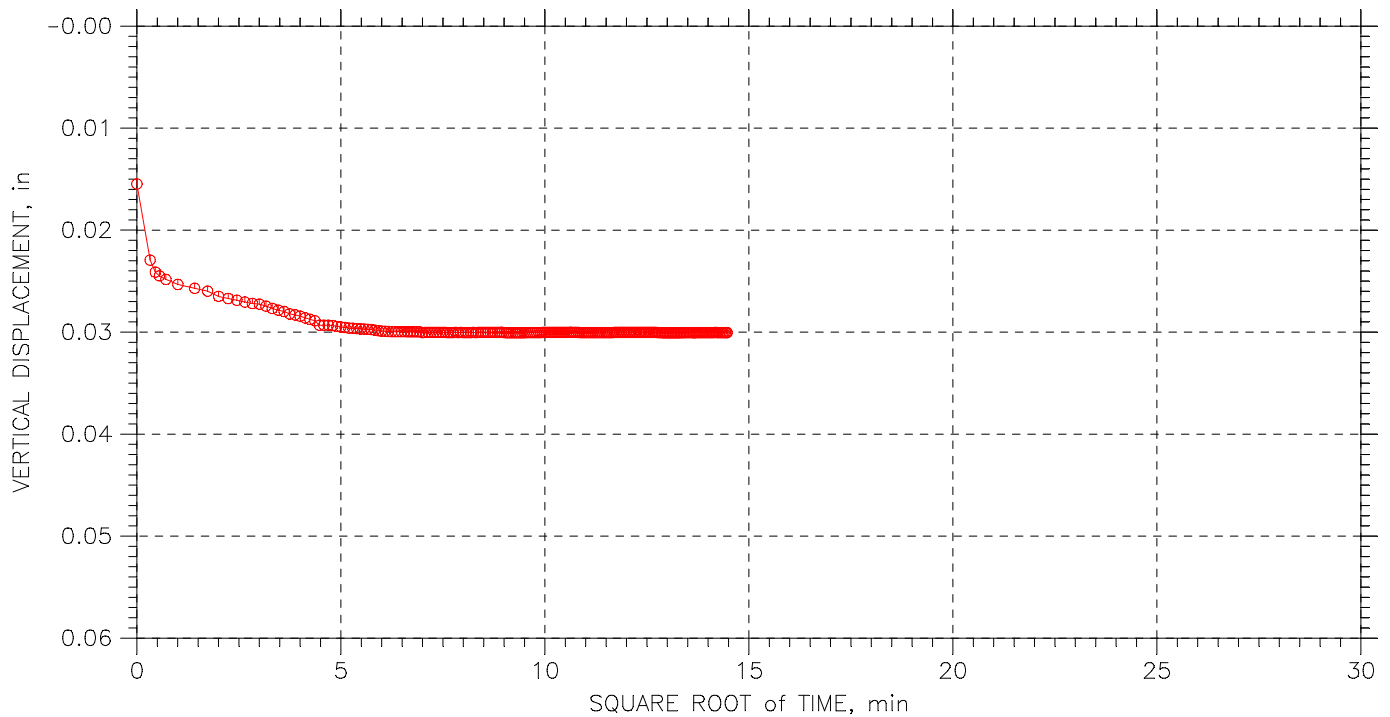
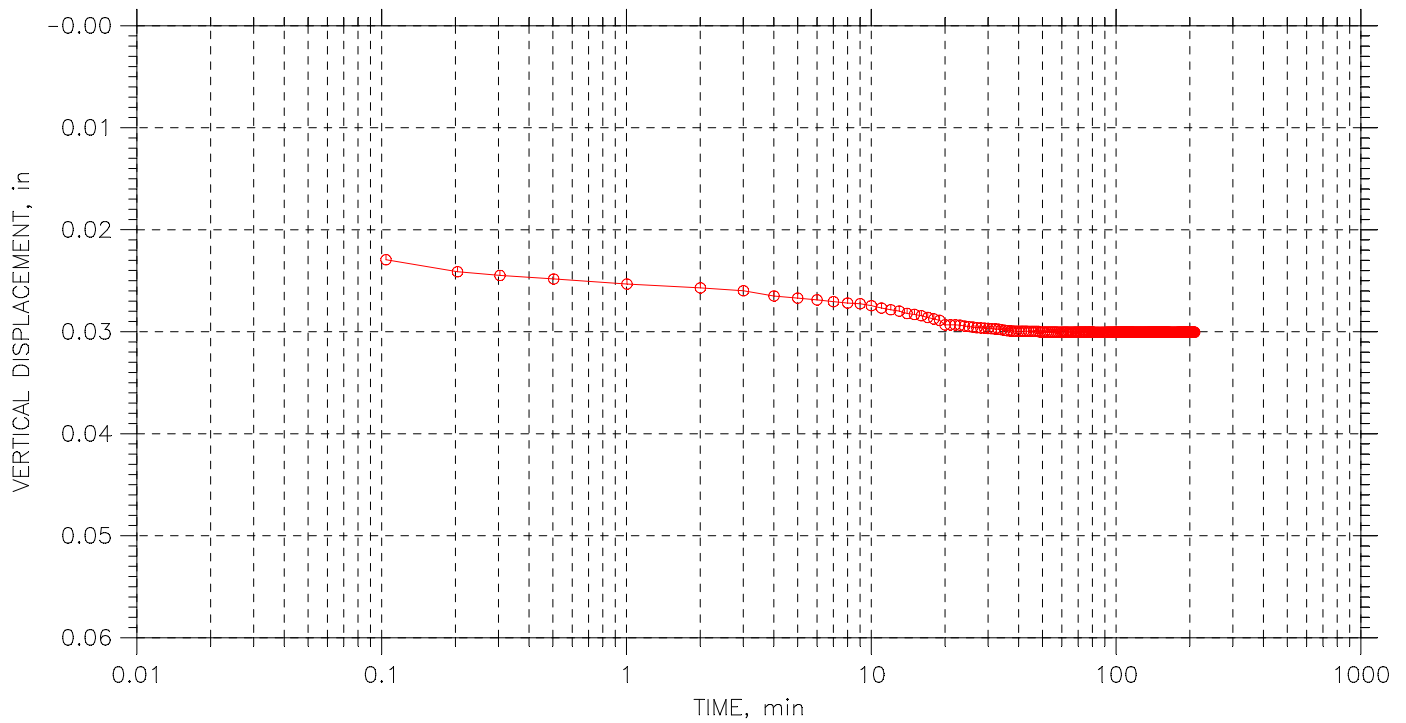
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 9/10/07	Depth: 56.7'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI cons		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

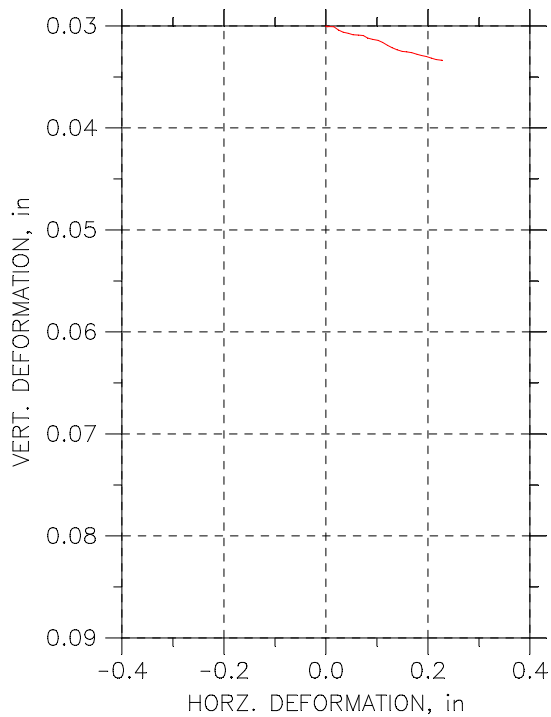
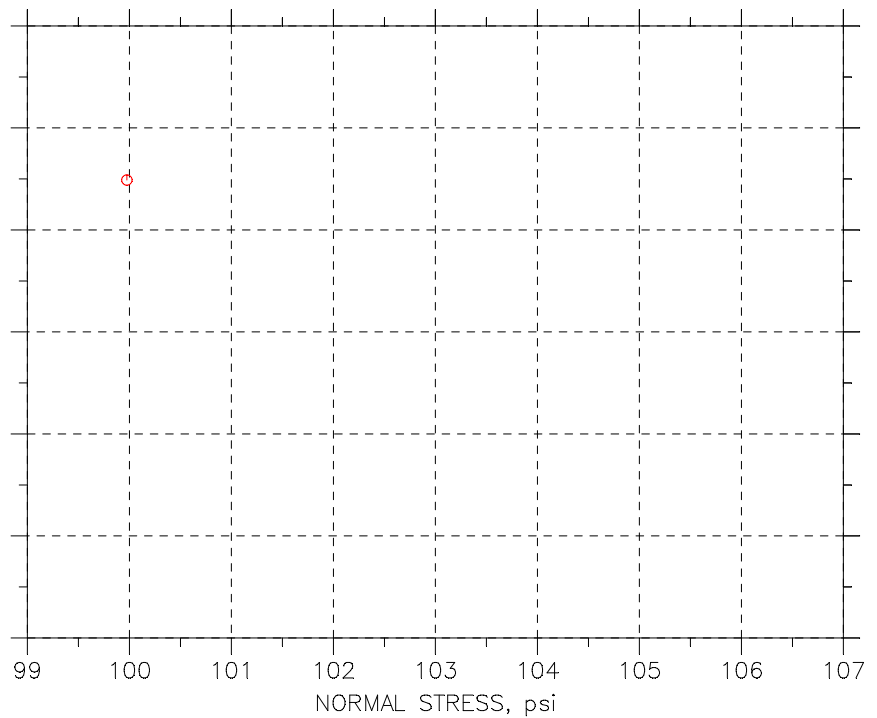
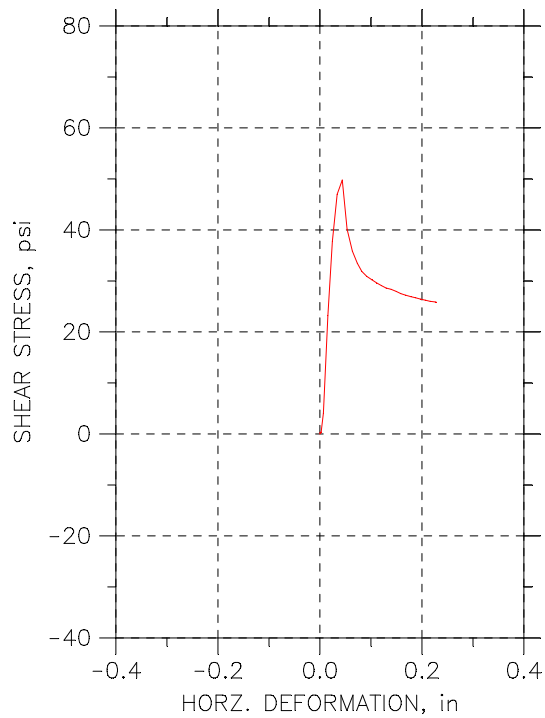
Step: 3 of 3

Stress: 100 psi



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 9/10/07	Depth: 56.7'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI cons		

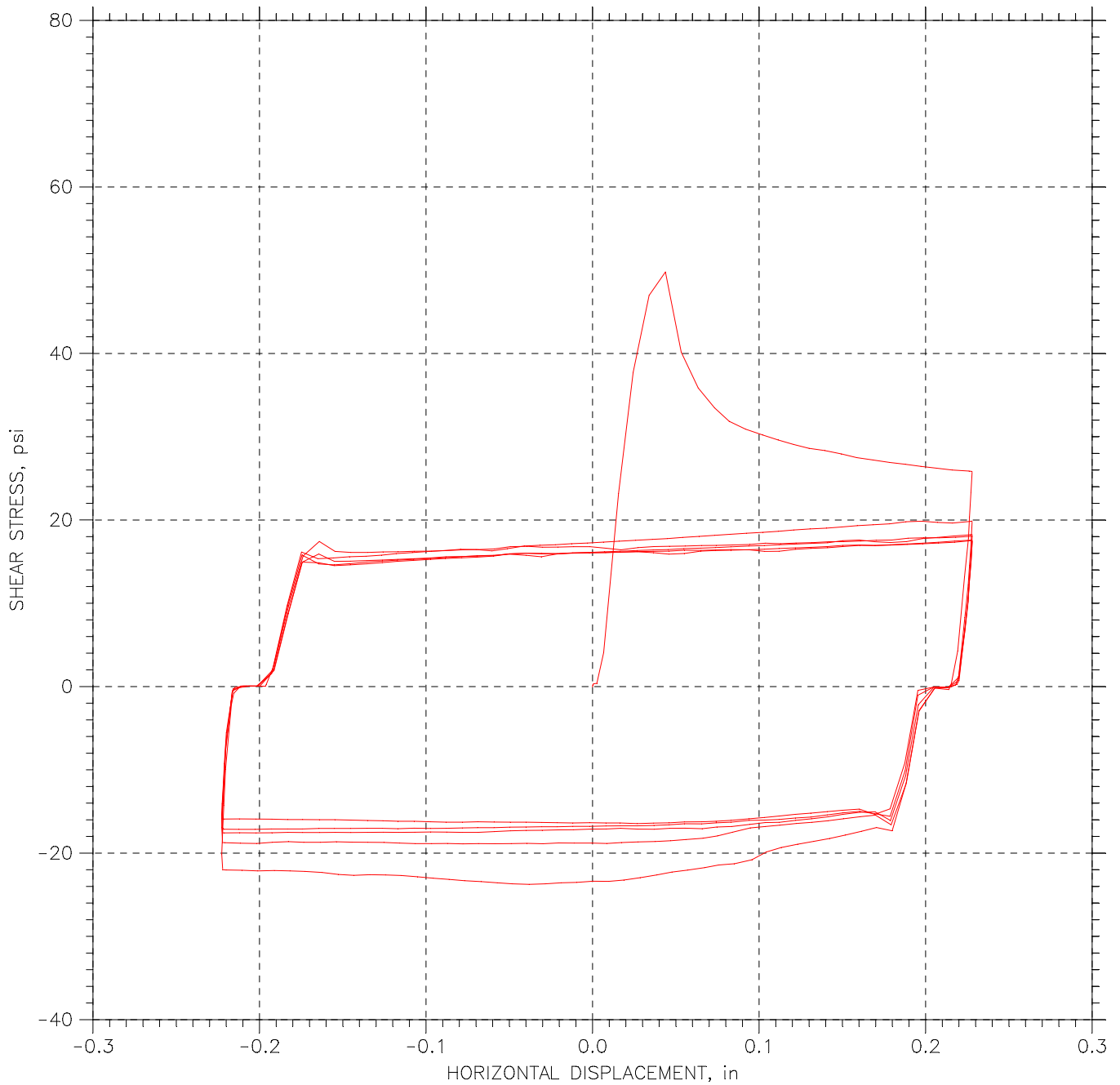
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-3			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	23.23		
	Dry Density, pcf	109.6		
	Saturation, %	116.48		
	Void Ratio	0.53844		
Consol. Height, in		0.96995		
Consol. Void Ratio		0.49221		
Final	Water Content, %	21.09		
	Dry Density, pcf	119.5		
	Saturation, %	138.62		
	Void Ratio	0.41084		
Normal Stress, psi		99.975		
Max. Shear Stress, psi		49.785		
Res Shear Stress, psi		25.828		
Time to Failure, min		5.0038		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		65		
Plastic Limit		28		
Plasticity Index		37		

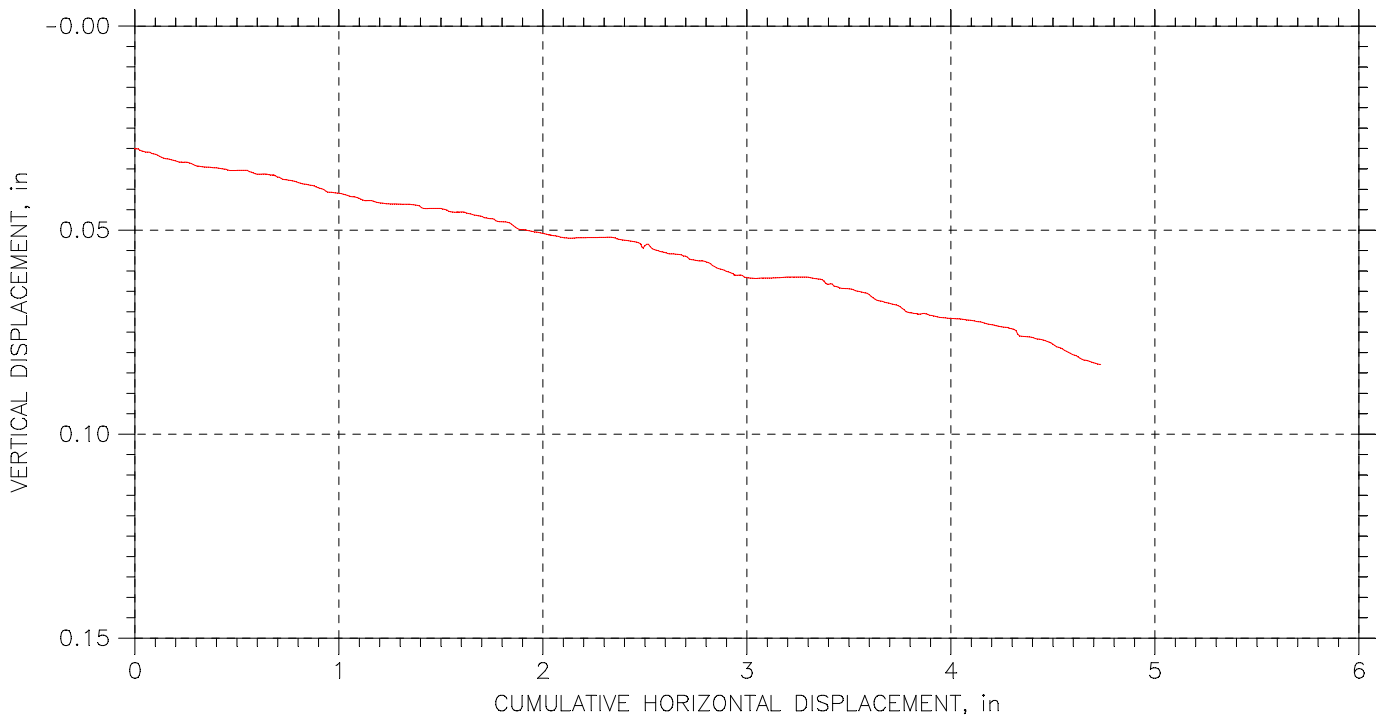
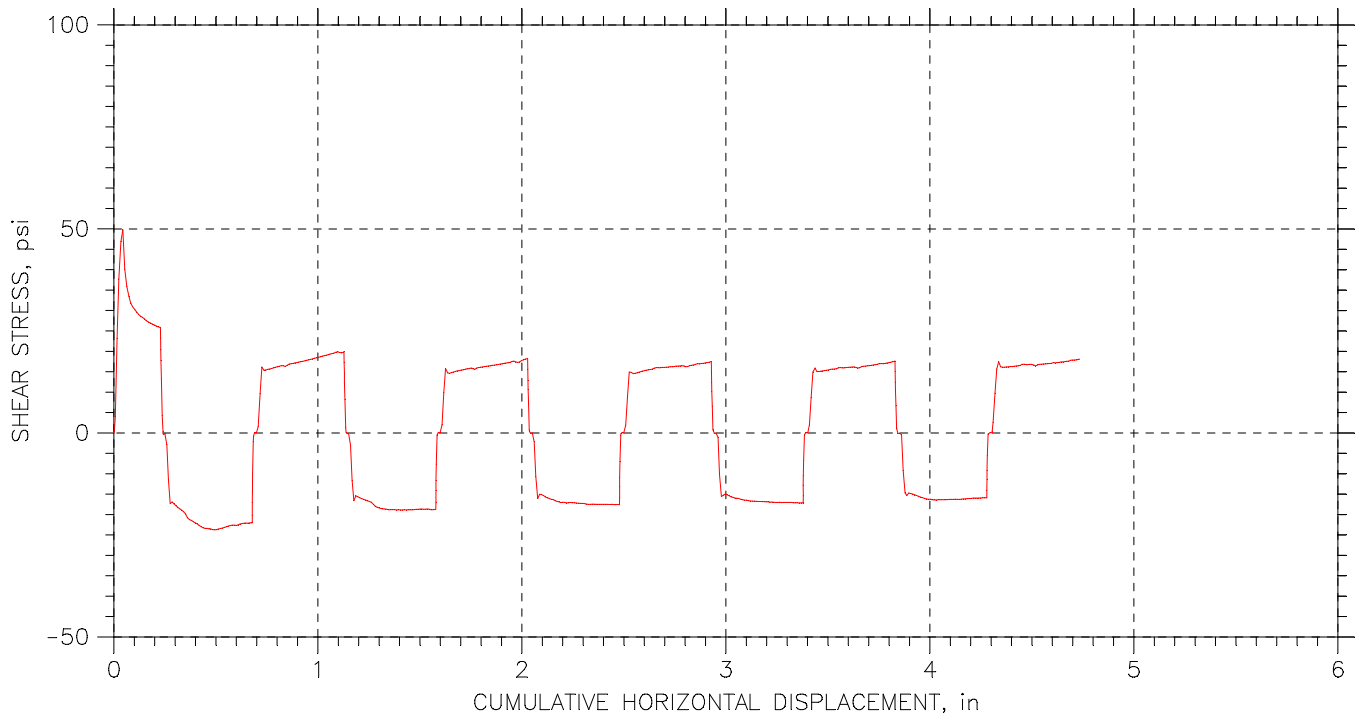
Project: Purple Line
 Location: College Park
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)
 Remarks: Constant Volume (Samples not allowed to swell before testing)

RESIDUAL SHEAR TEST



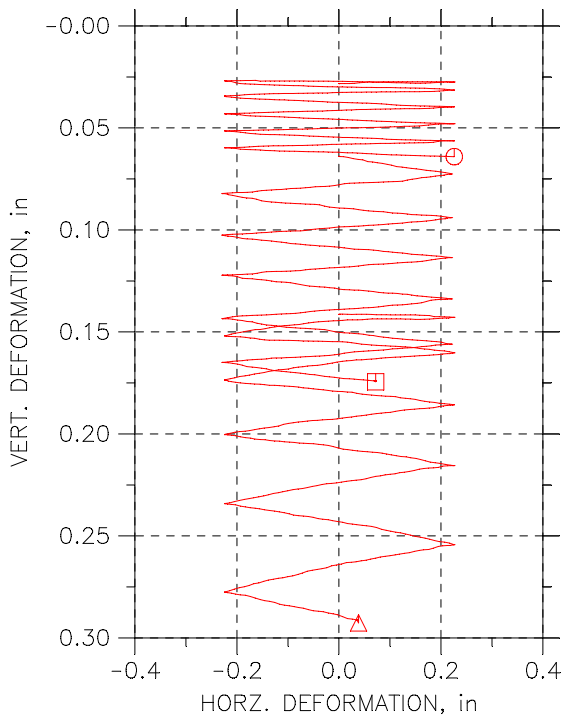
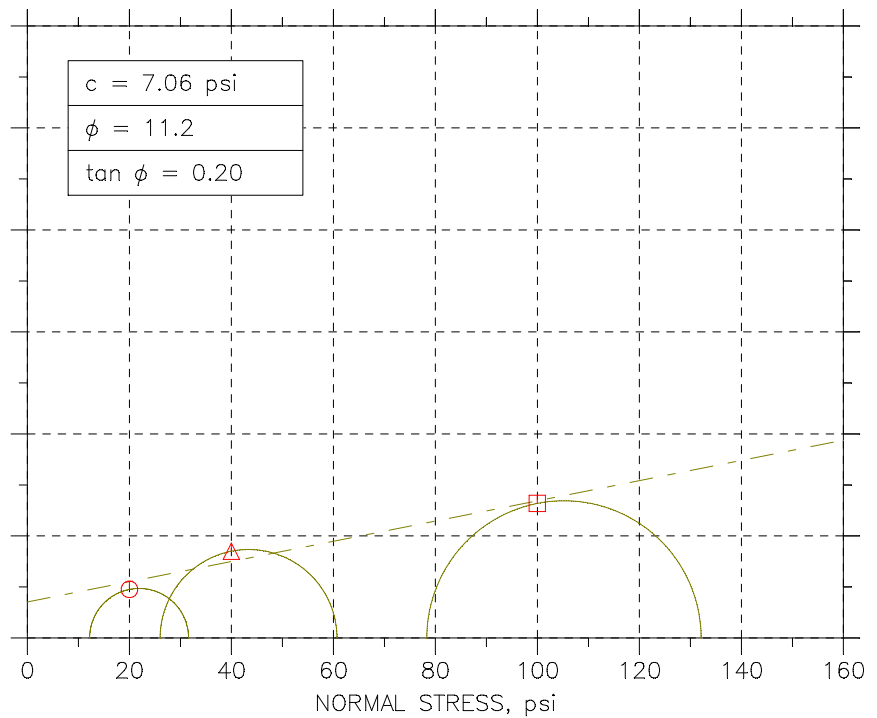
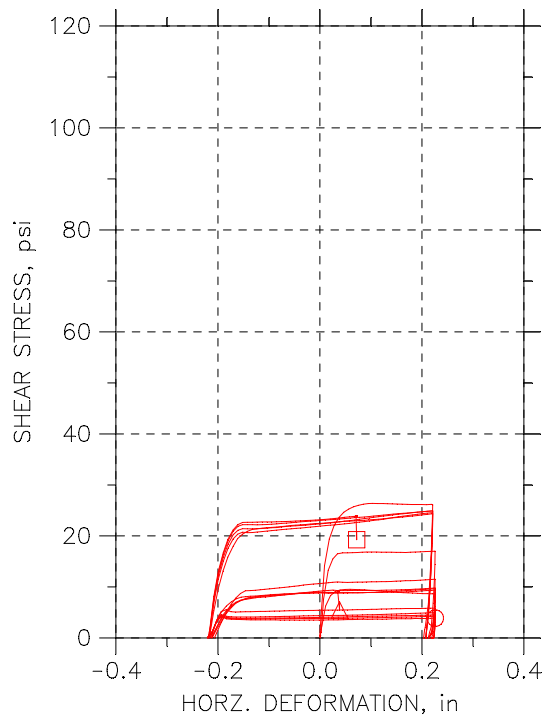
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 9/10/07	Depth: 56.7'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI cons		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 9/10/07	Depth: 56.7'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay trace fine Sand (CH)		
Remarks: Constant Volume (Samples not allowed to swell before testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI cons		

DIRECT SHEAR TEST REPORT



Symbol	⊖	△	⊞	
Test No.	B-1	B-2	B-3	
Sample No.	P-3	P-3	P-3	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	24.87	35.02	34.20
	Dry Density, pcf	108.93	99.172	100.92
	Saturation, %	122.68	135.15	137.81
	Void Ratio	0.54741	0.69963	0.67014
Consol. Height, in		0.97161	0.85857	0.93618
Consol. Void Ratio		0.50348	0.45925	0.56355
Final	Water Content, %	24.23	28.00	24.37
	Dry Density, pcf	116.39	140.21	122.25
	Saturation, %	145.95	373.86	173.71
	Void Ratio	0.44824	0.2022	0.37882
Normal Stress, psi		20.007	39.988	99.975
Max. Shear Stress, psi		9.5148	17.001	26.375
Res. Shear Stress, psi		3.8755	5.4737	19.245
Time to Failure, min		7.0034	24.048	12.003
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		65	65	65
Plastic Limit		28	28	28
Plasticity Index		37	37	37

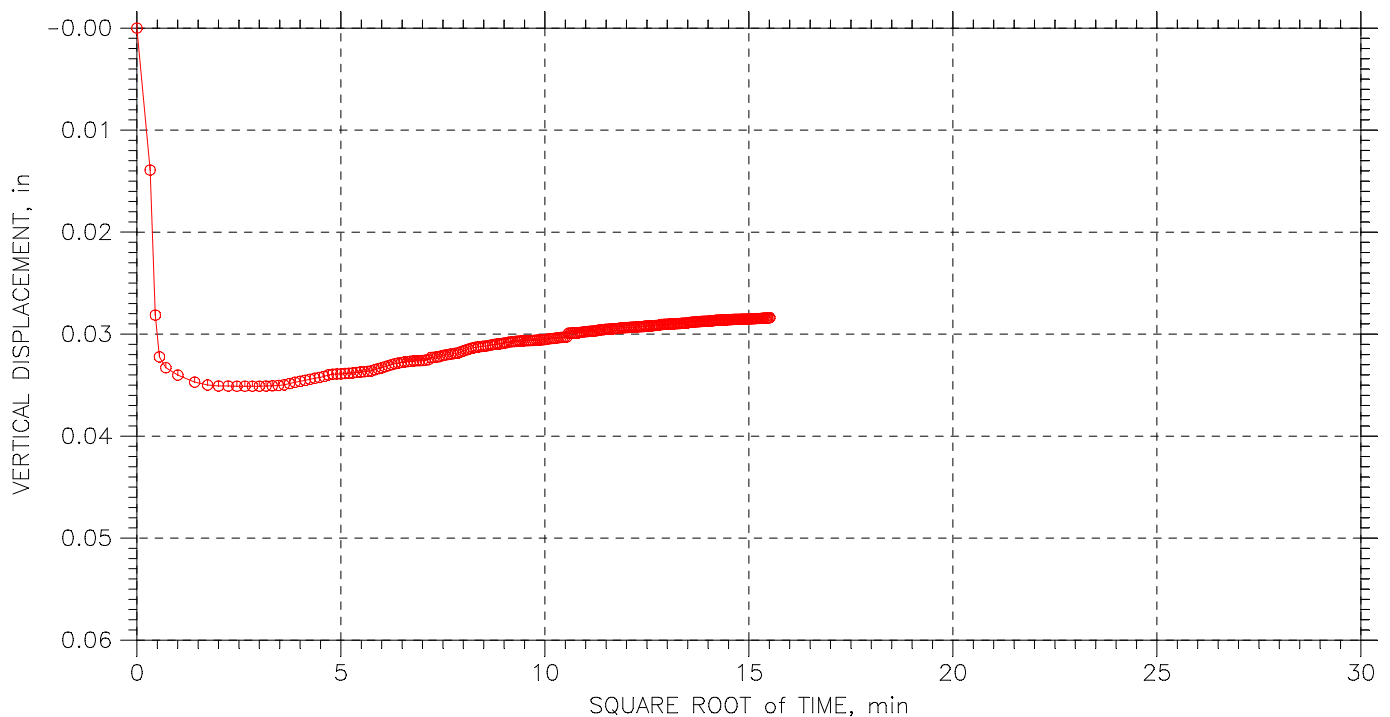
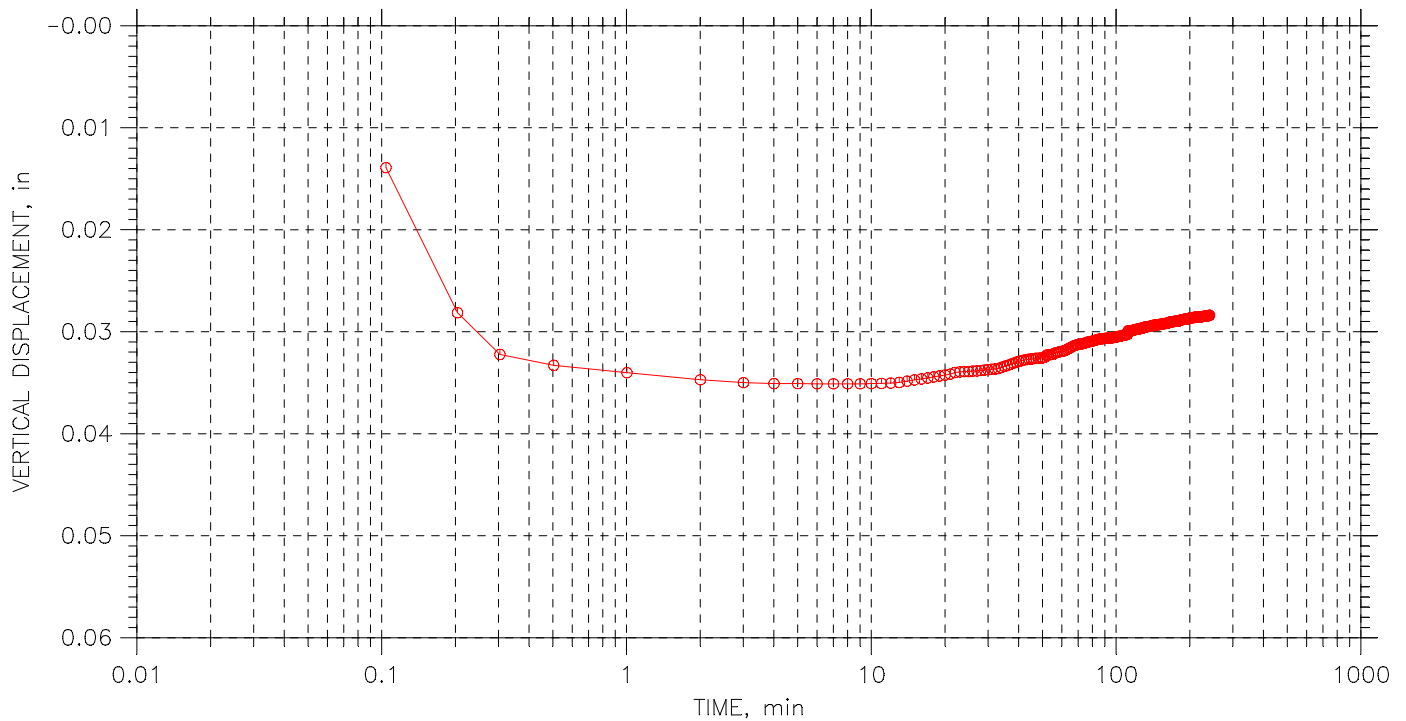
Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)
 Remarks: Constant Load (Sample Allowed to Swell before shearing)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

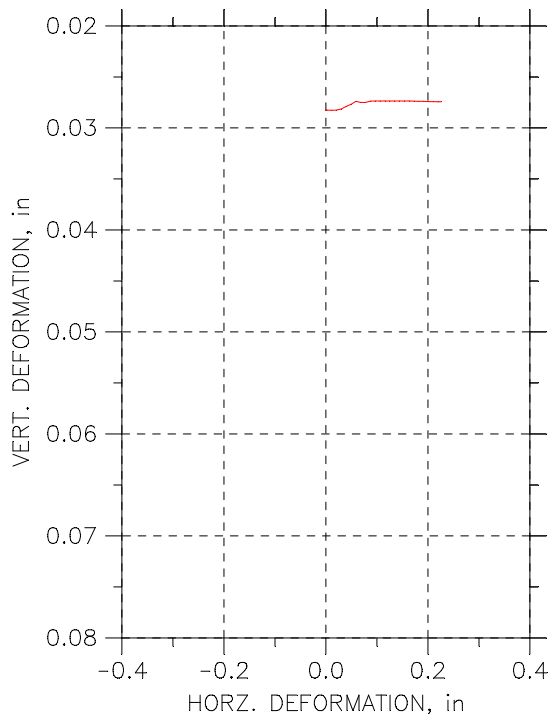
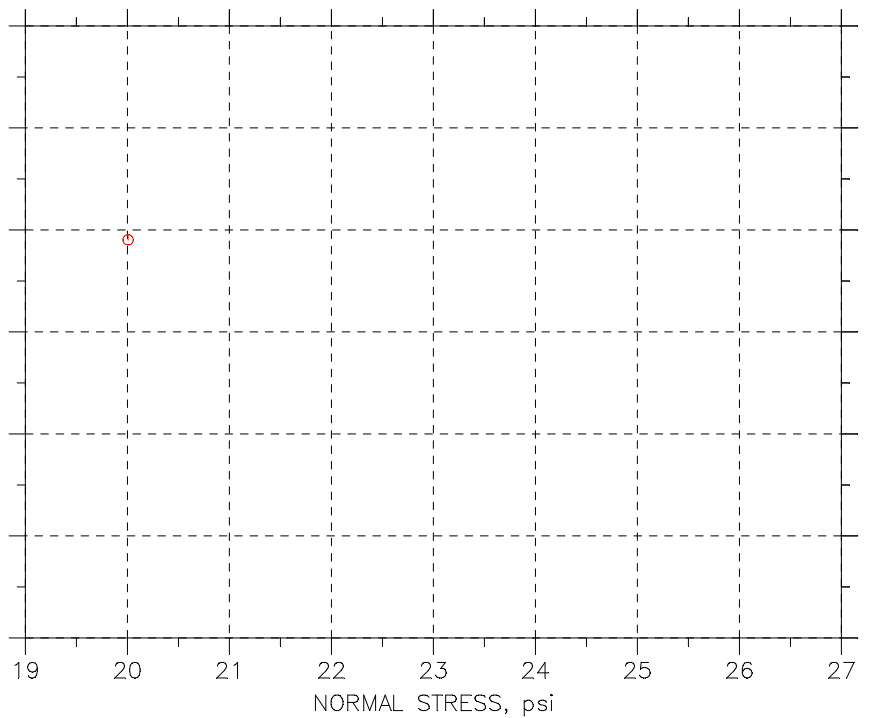
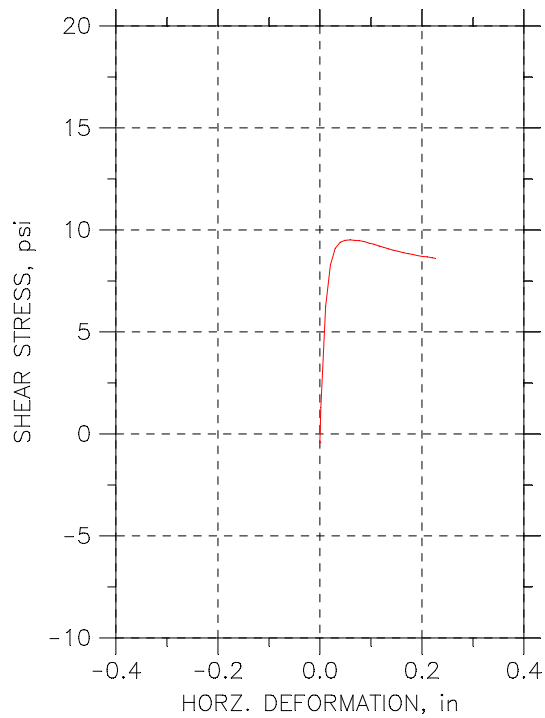
Step: 1 of 1

Stress: 20 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/9/07	Depth: 56.9'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample Allowed to Swell before shearing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 20PSI const		

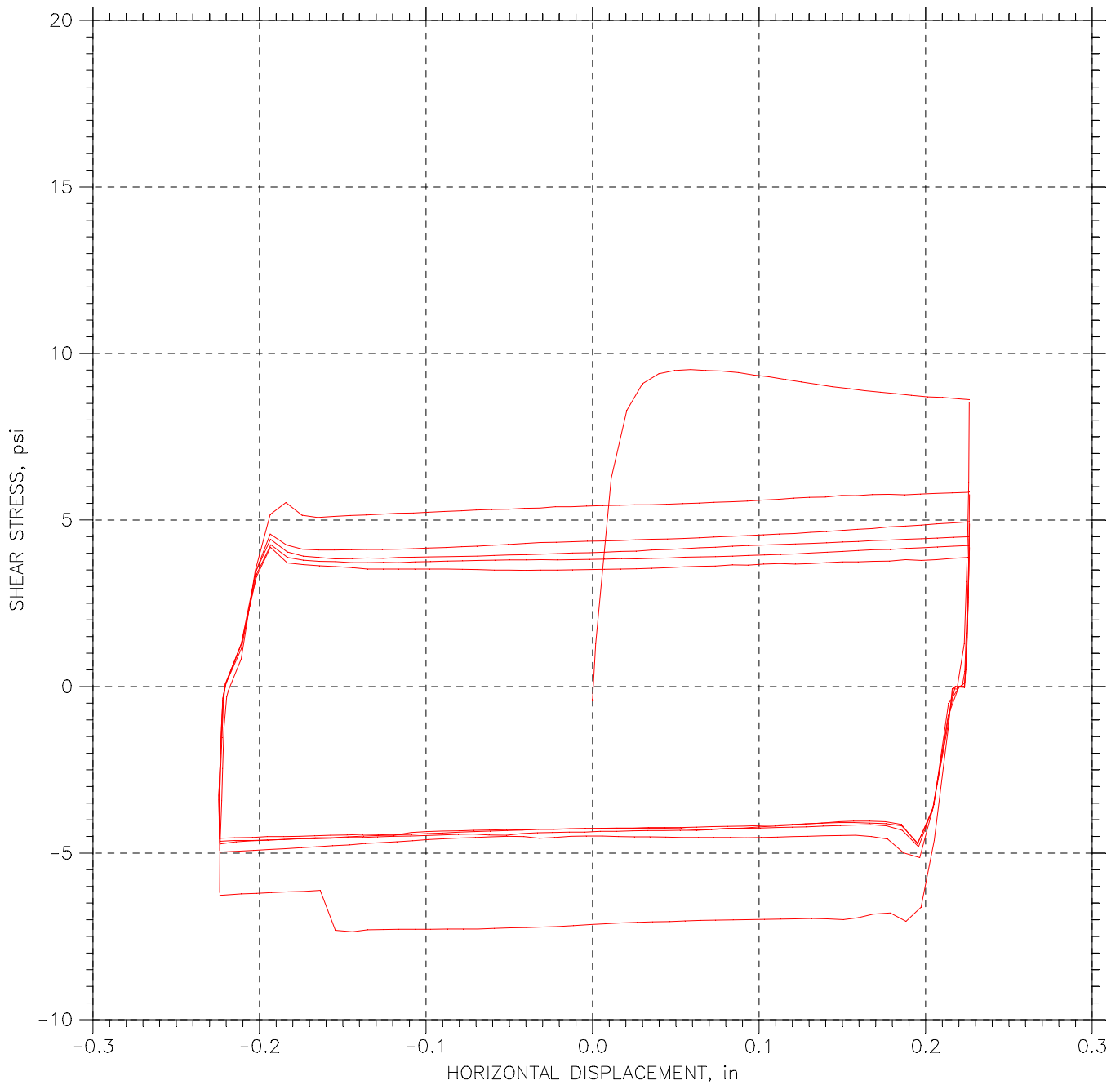
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-1			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	24.87		
	Dry Density, pcf	108.9		
	Saturation, %	122.68		
	Void Ratio	0.54741		
Consol. Height, in		0.97161		
Consol. Void Ratio		0.50348		
Final	Water Content, %	24.23		
	Dry Density, pcf	116.4		
	Saturation, %	145.95		
	Void Ratio	0.44824		
Normal Stress, psi		20.007		
Max. Shear Stress, psi		9.5148		
Res. Shear Stress, psi		8.6122		
Time to Failure, min		7.0034		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		65		
Plastic Limit		28		
Plasticity Index		37		

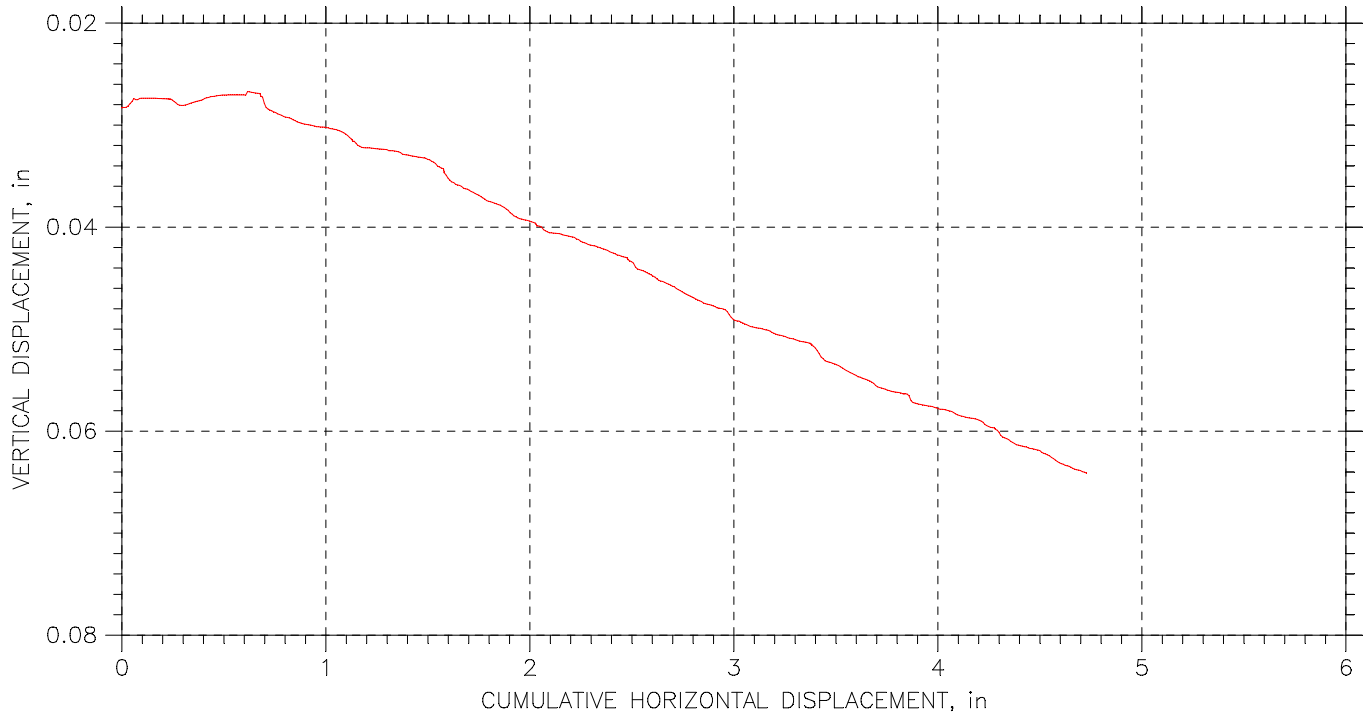
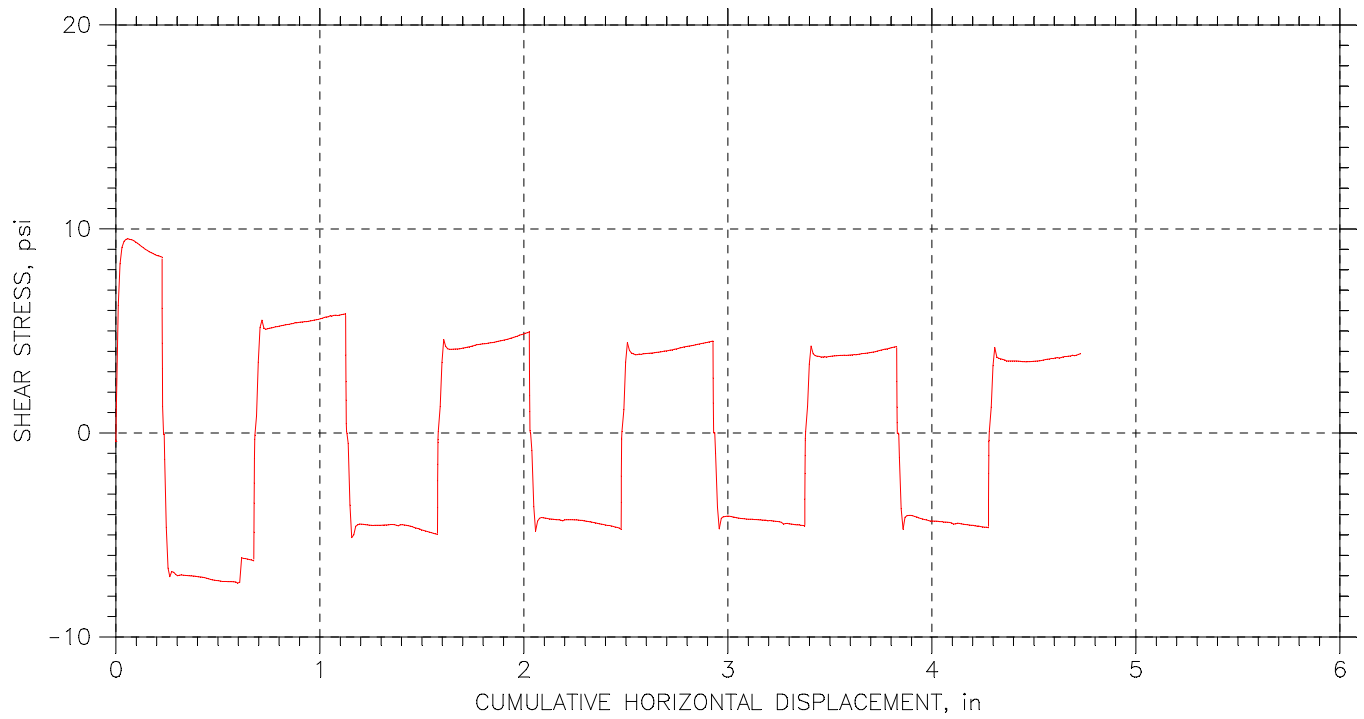
Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)
 Remarks: Constant Load (Sample Allowed to Swell before shearing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/9/07	Depth: 56.9'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample Allowed to Swell before shearing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 20PSI const		

RESIDUAL SHEAR TEST



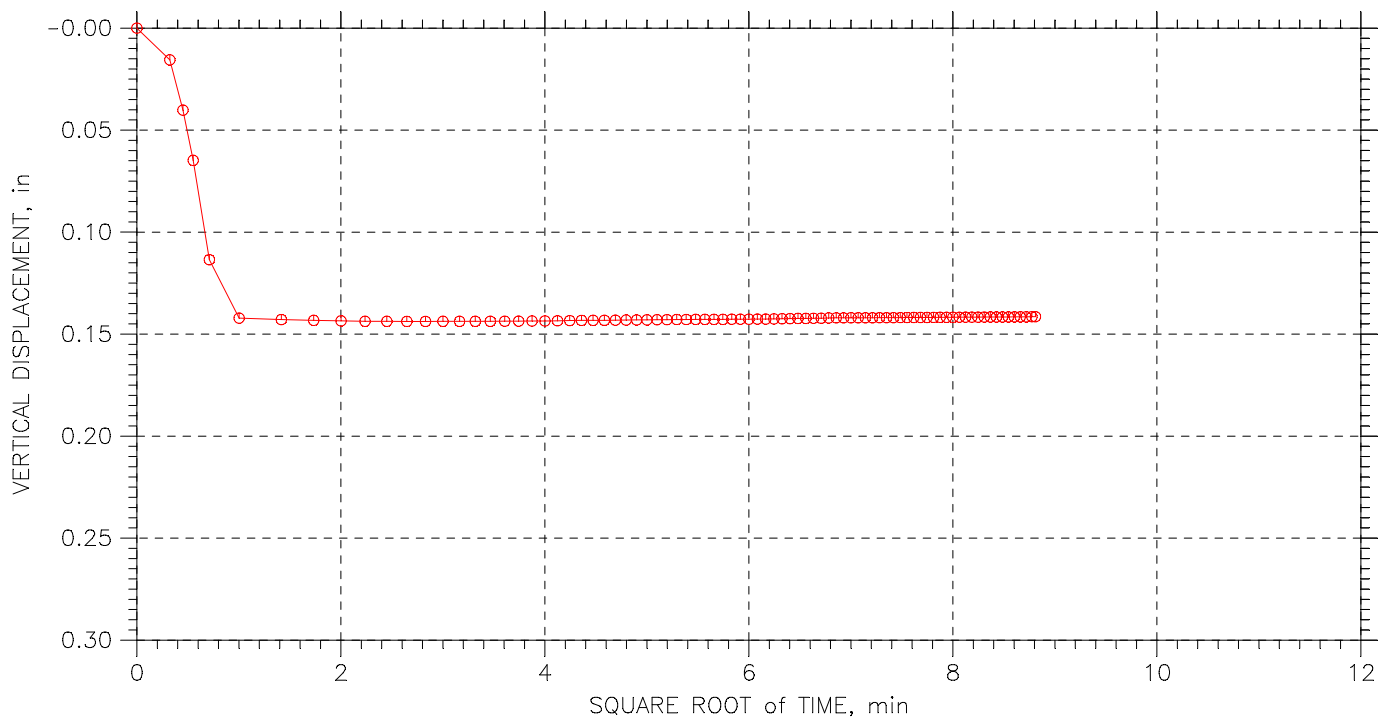
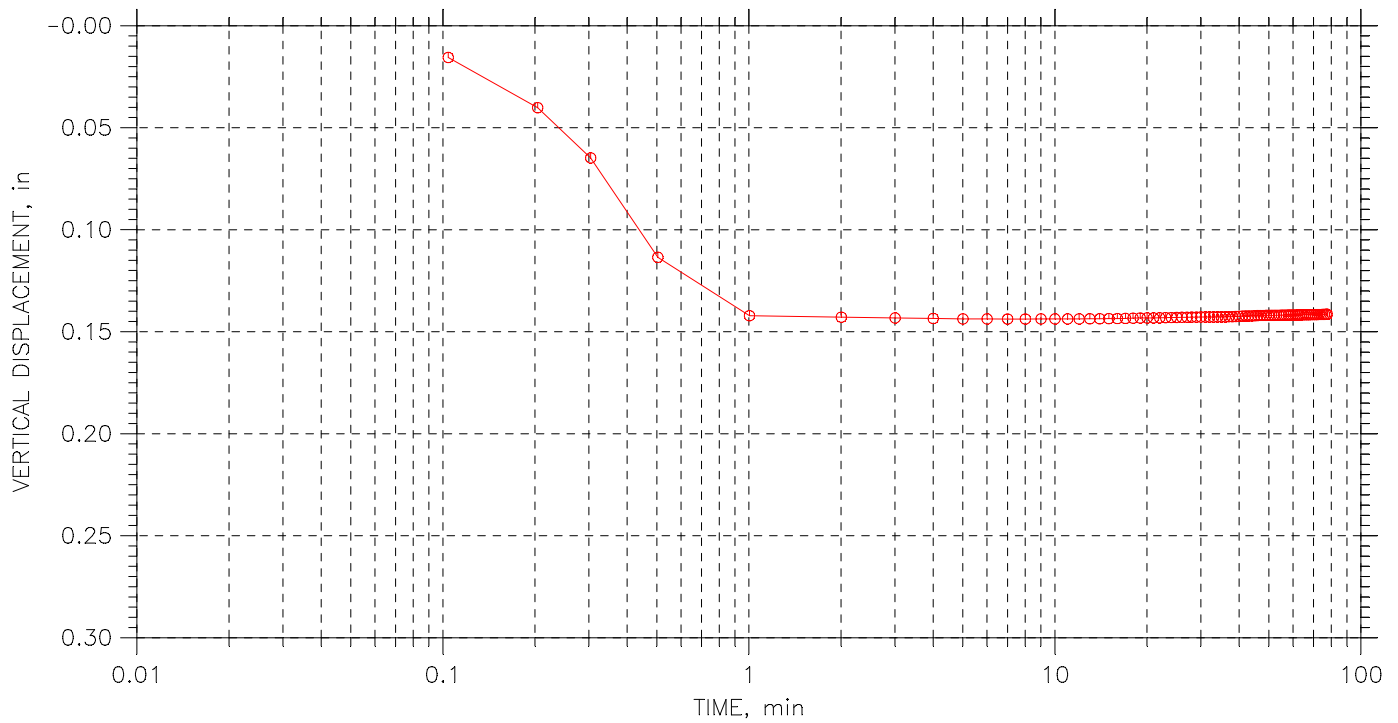
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/9/07	Depth: 56.9'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample Allowed to Swell before shearing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 20PSI const		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 1

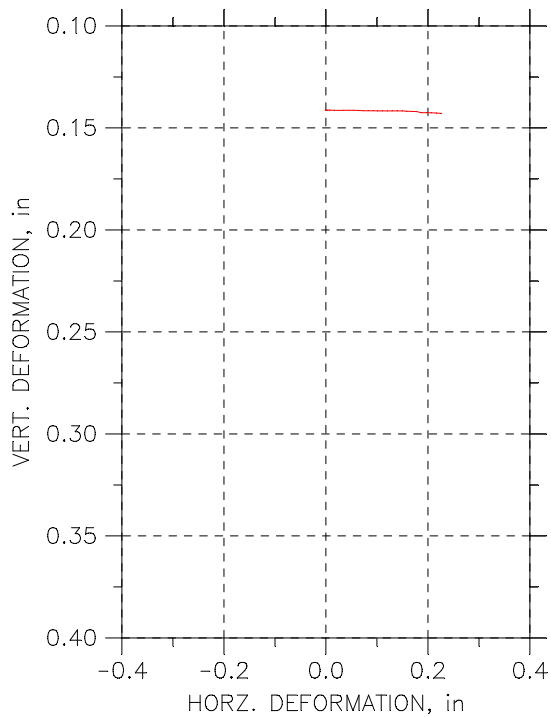
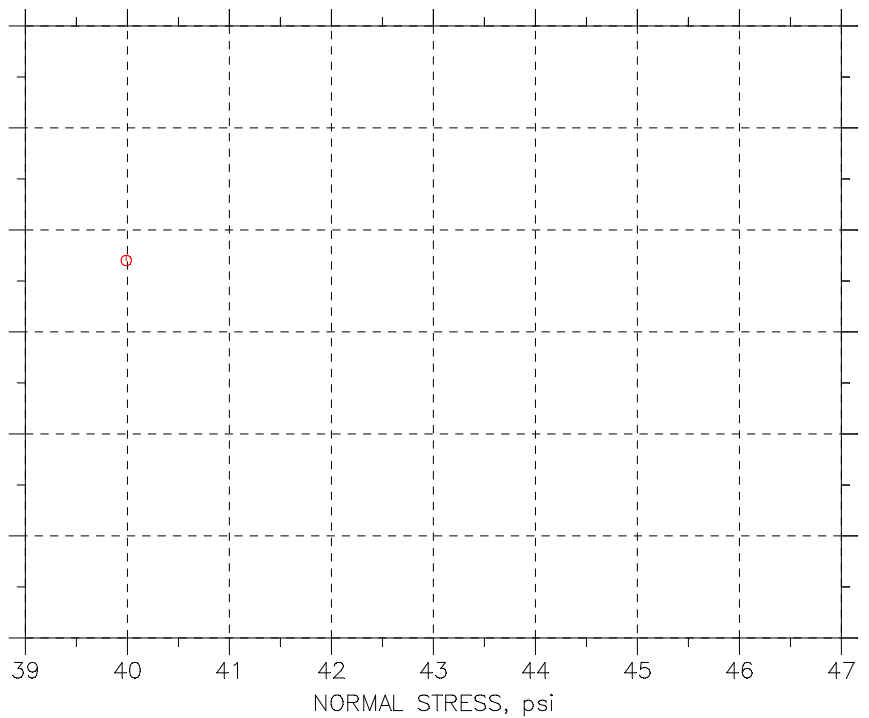
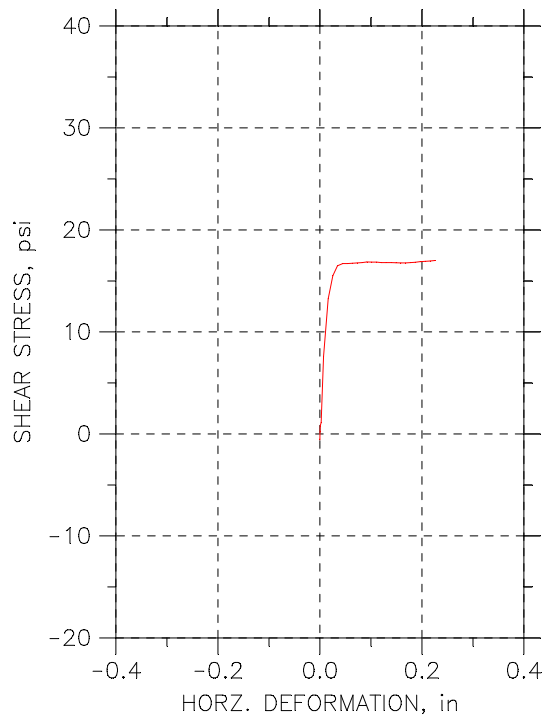
Stress: 40 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/9/07	Depth: 57.0'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 40PSI const		

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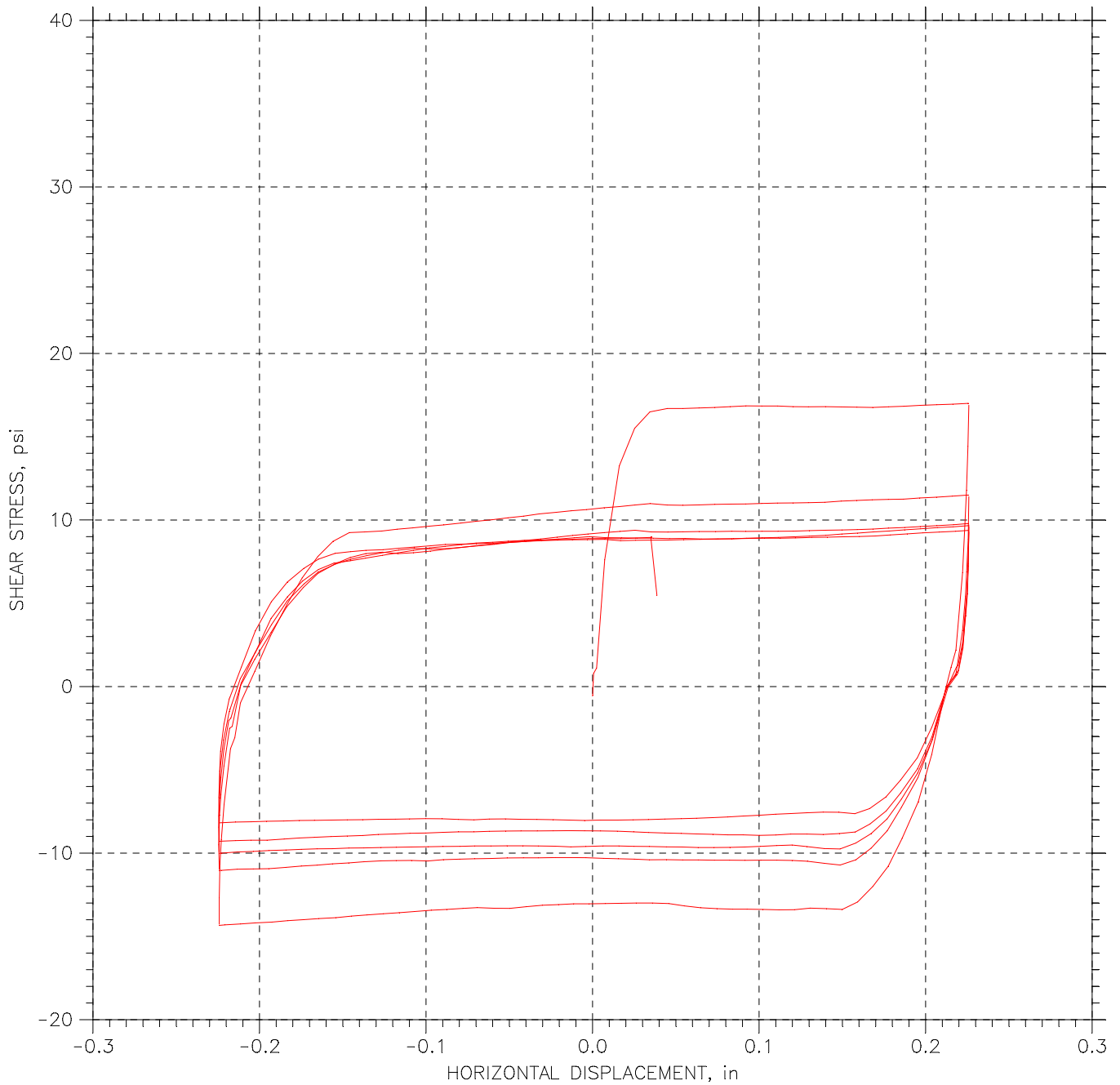
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-2			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	35.02		
	Dry Density, pcf	99.17		
	Saturation, %	135.15		
	Void Ratio	0.69963		
Consol. Height, in		0.85857		
Consol. Void Ratio		0.45925		
Final	Water Content, %	28.00		
	Dry Density, pcf	140.2		
	Saturation, %	373.86		
	Void Ratio	0.2022		
Normal Stress, psi		39.988		
Max. Shear Stress, psi		17.001		
Res. Shear Stress, psi		17.001		
Time to Failure, min		24.002		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		65		
Plastic Limit		28		
Plasticity Index		37		

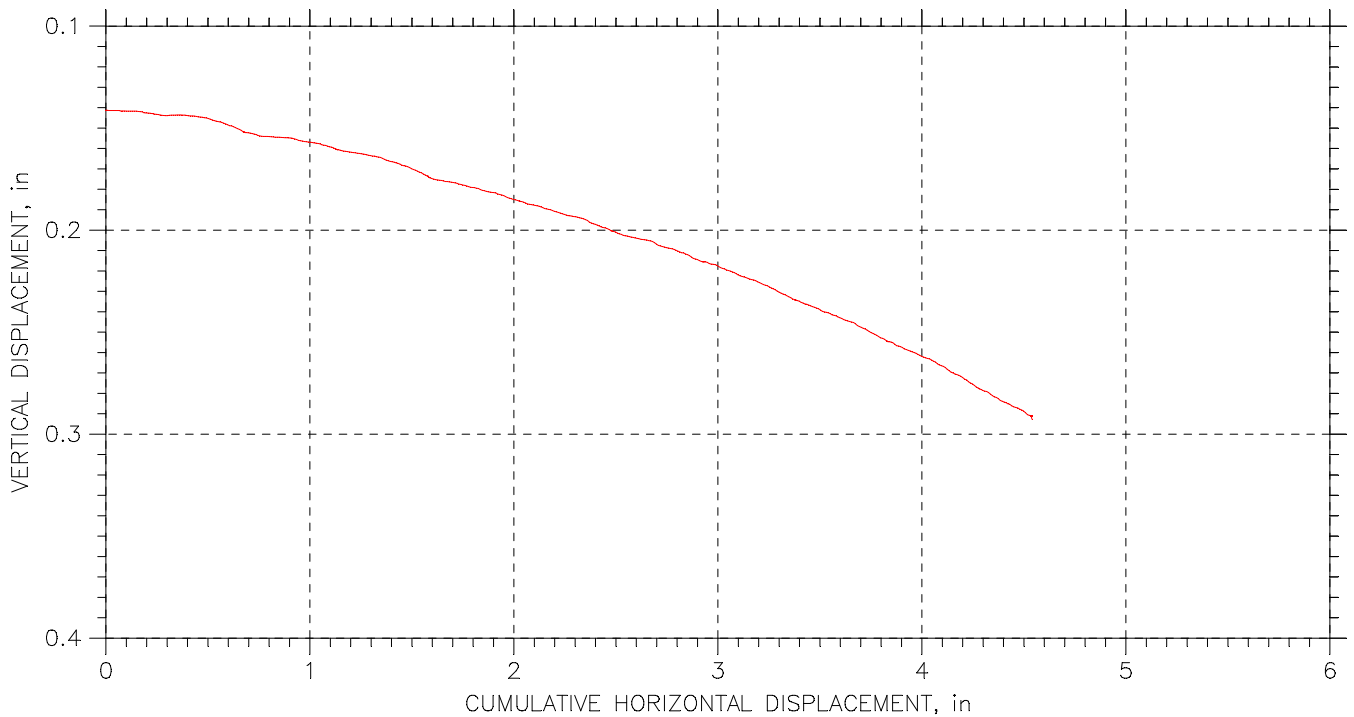
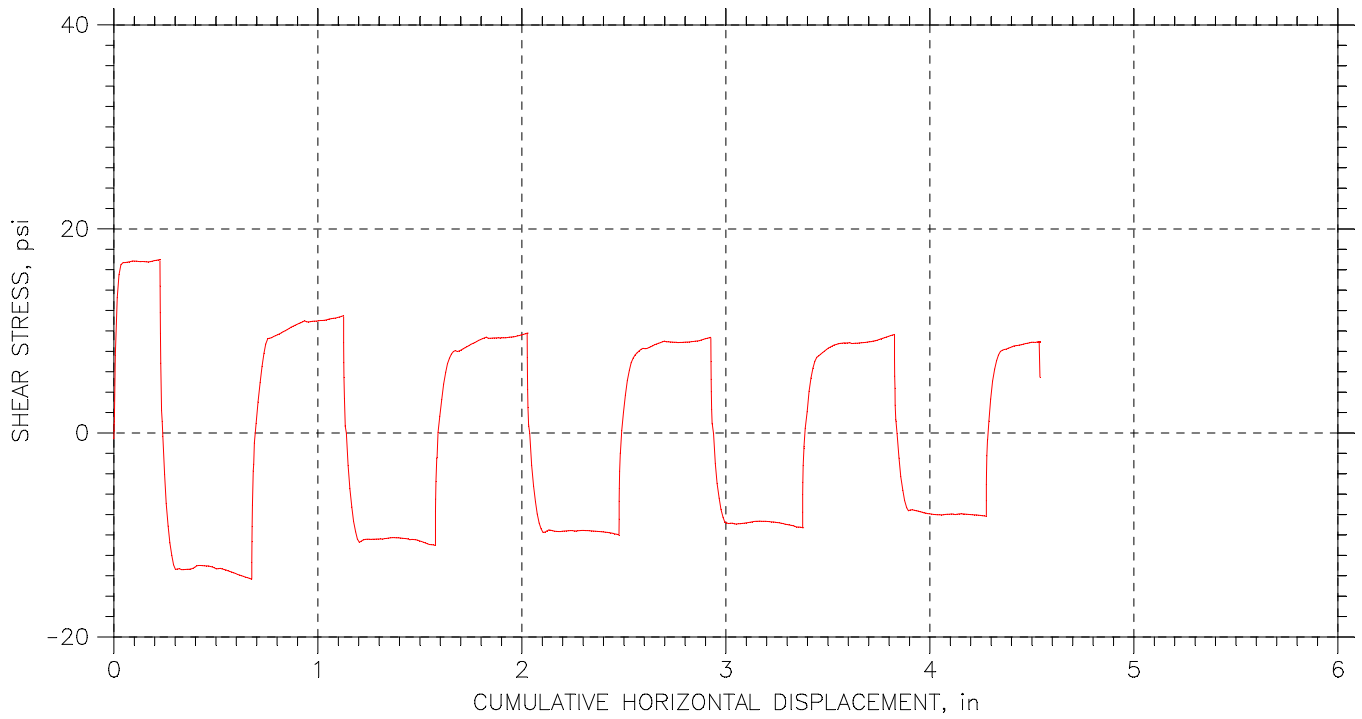
Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Brown Stiff CLAY with traces of fine Sand (CH)
 Remarks: Constant Load (Sample allowed to swell before shearing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/9/07	Depth: 57.0'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 40PSI const		

RESIDUAL SHEAR TEST



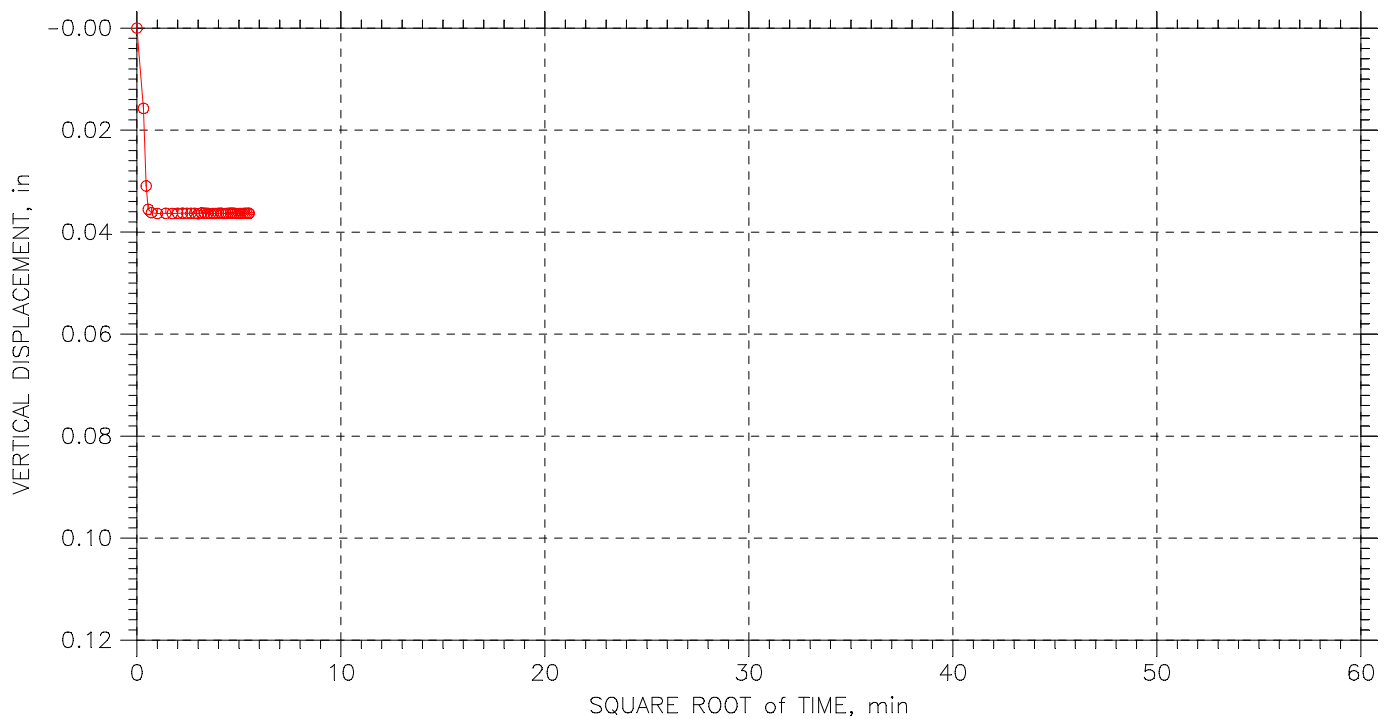
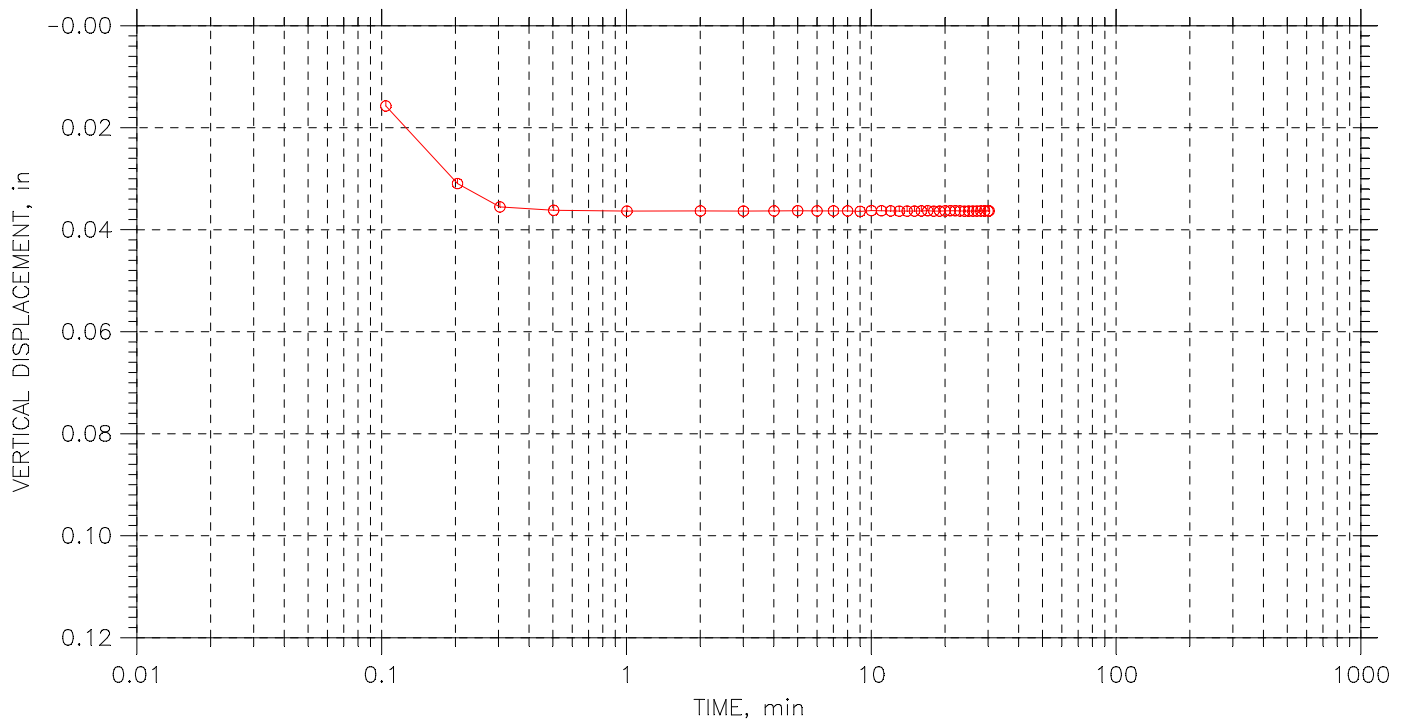
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/9/07	Depth: 57.0'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 40PSI const		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 3

Stress: 20 psi



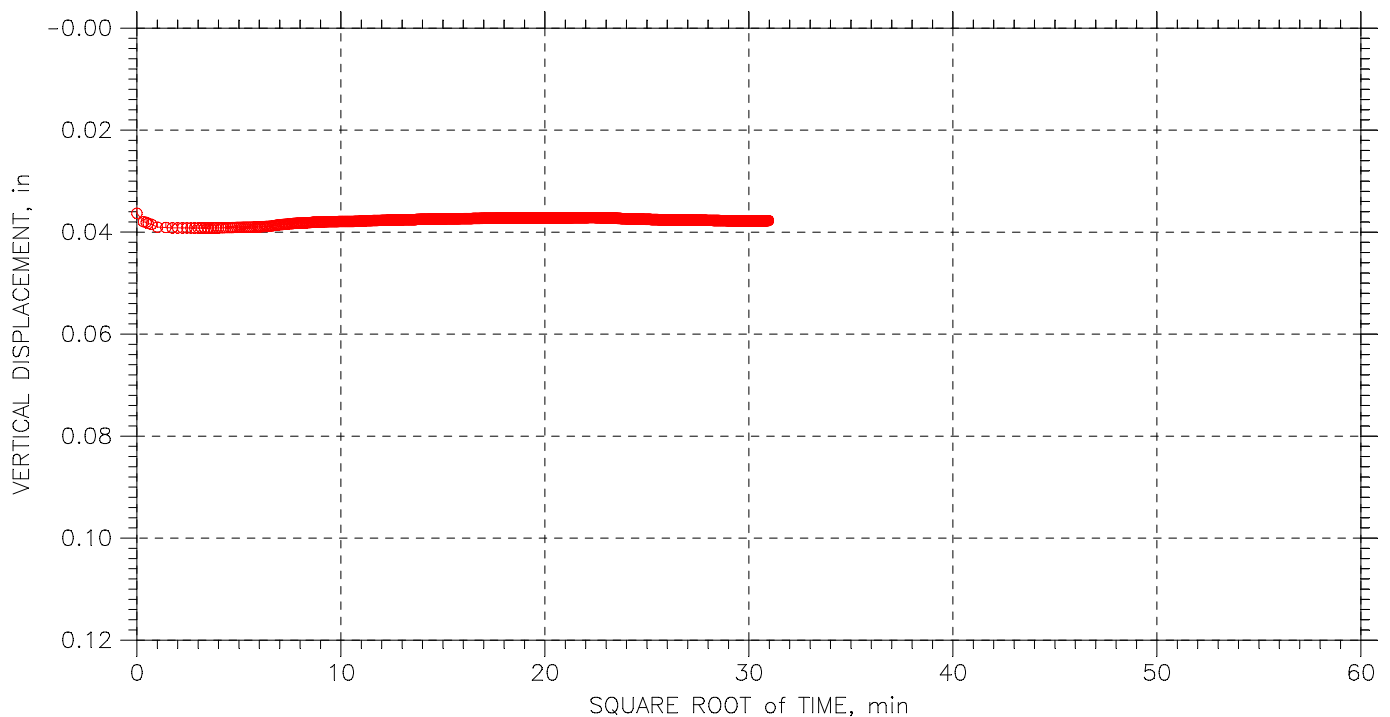
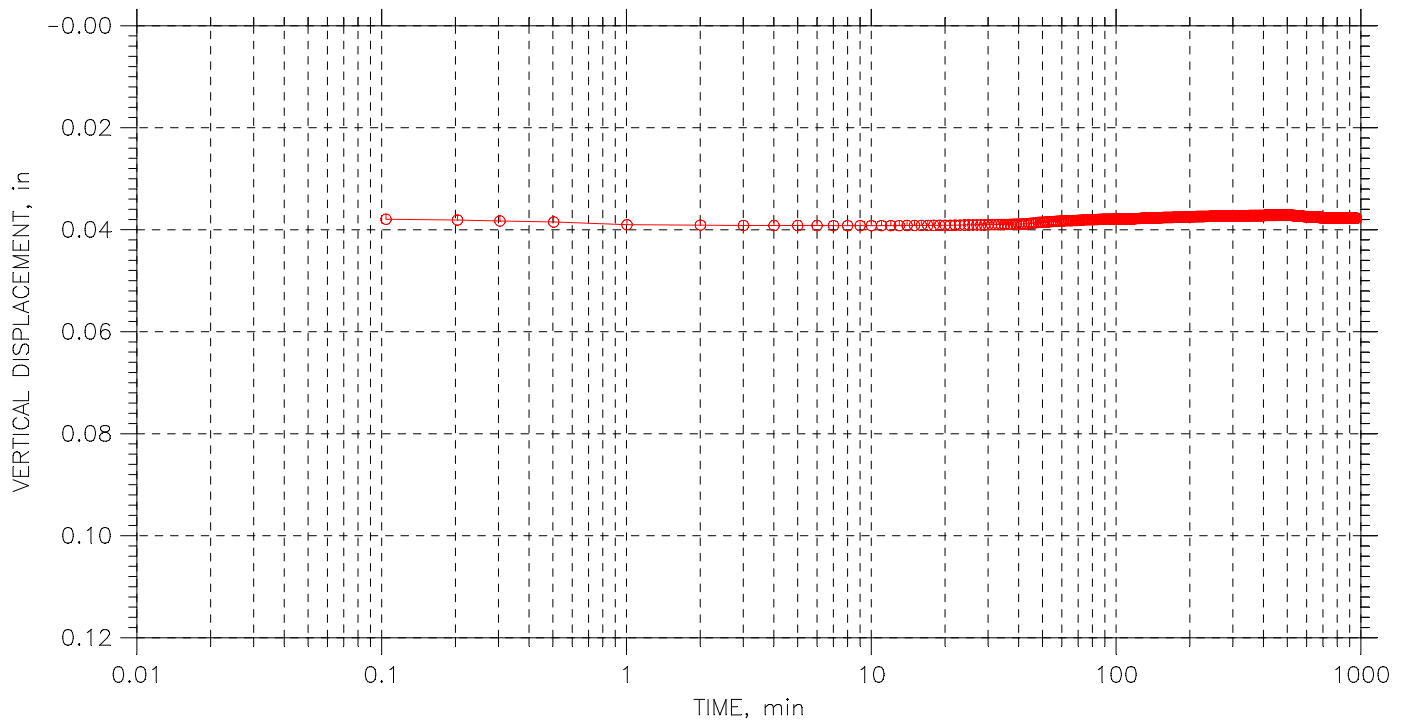
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/7/07	Depth: 57.2'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: E:\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI.dat		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 2 of 3

Stress: 40 psi



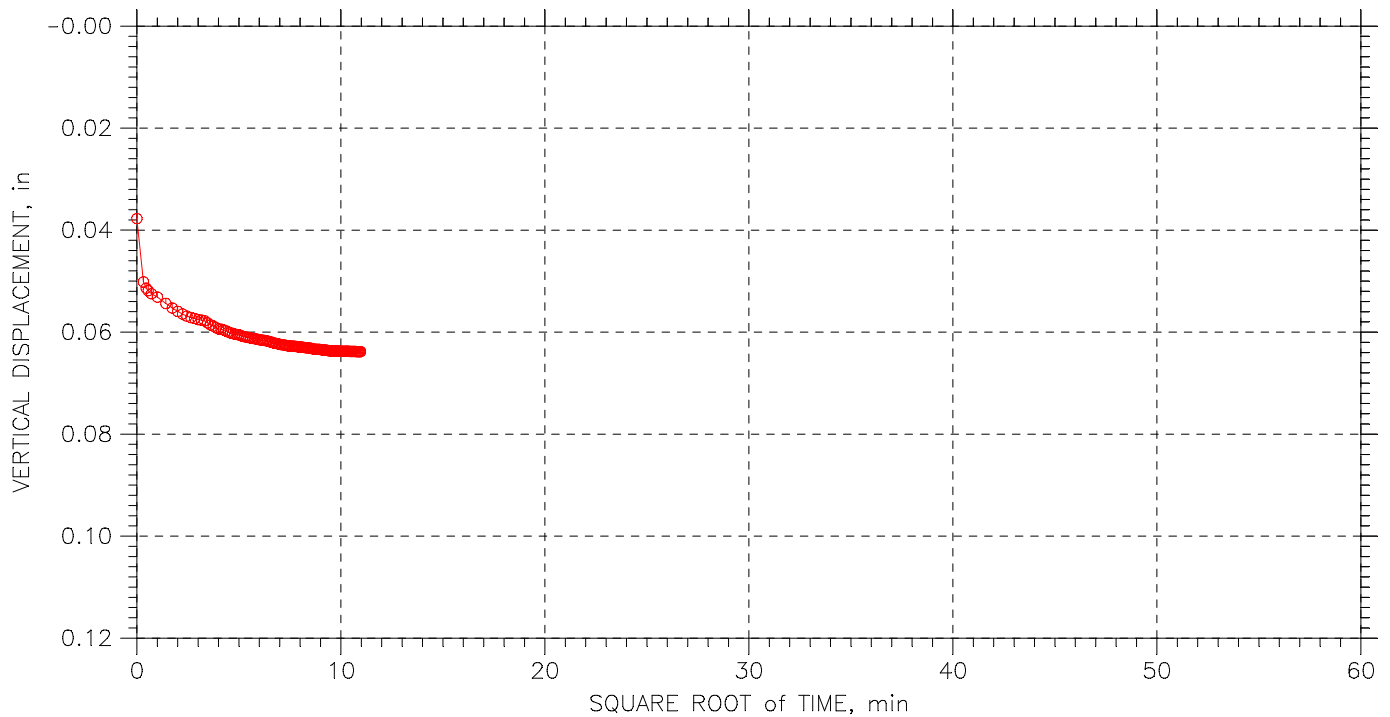
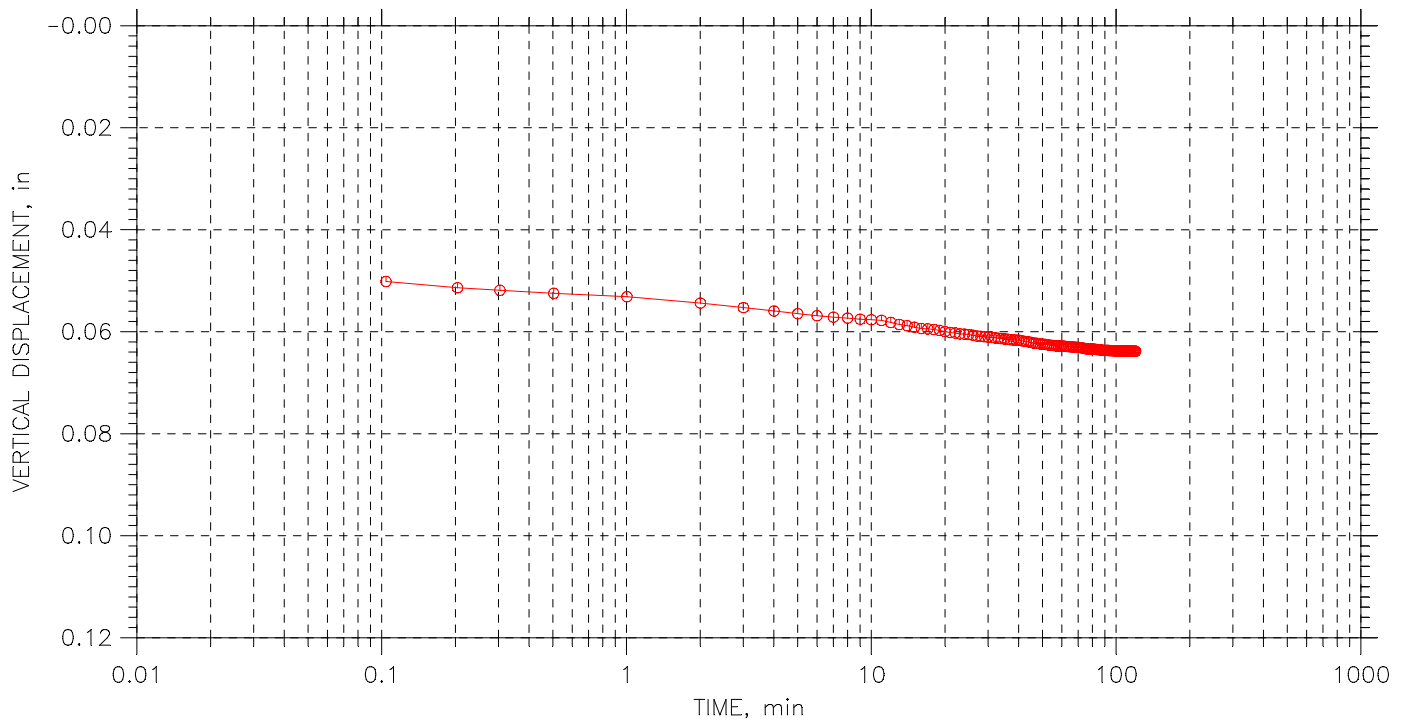
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/7/07	Depth: 57.2'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: E:\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI.dat		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

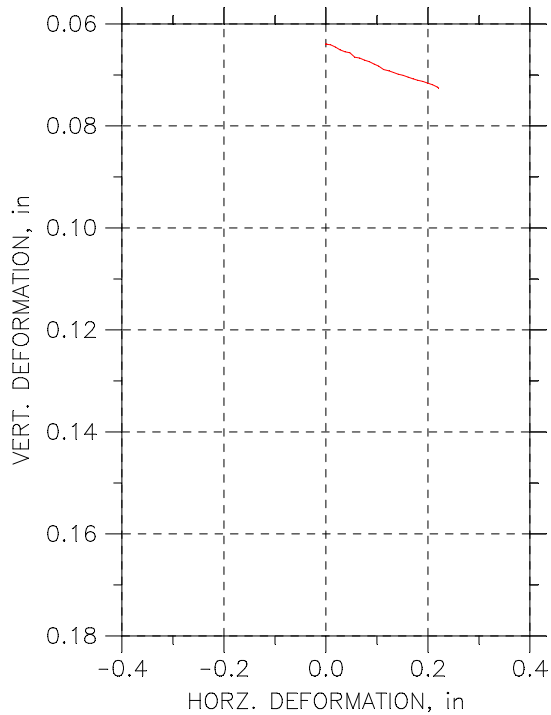
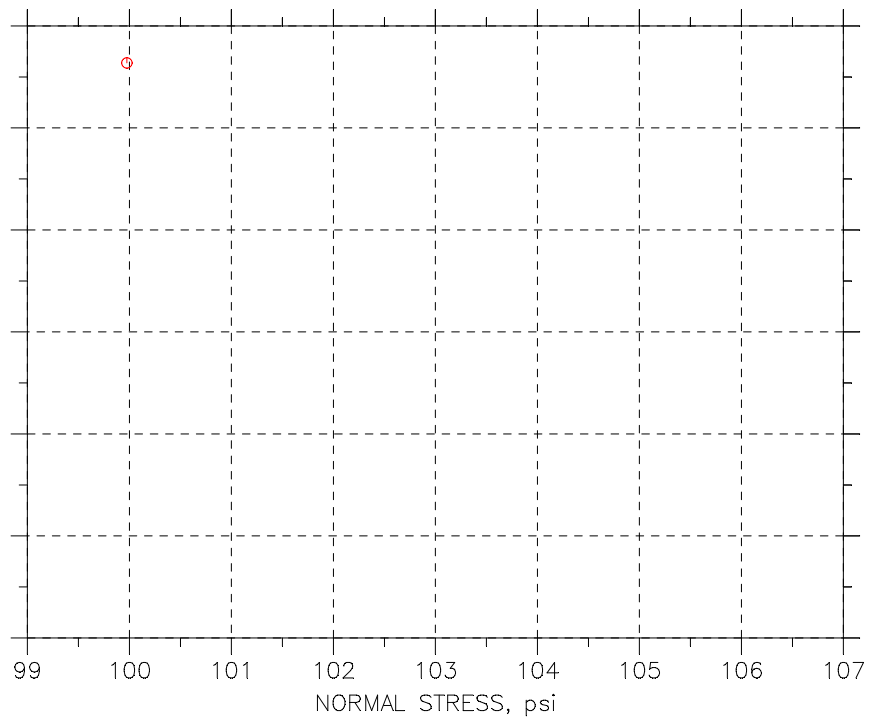
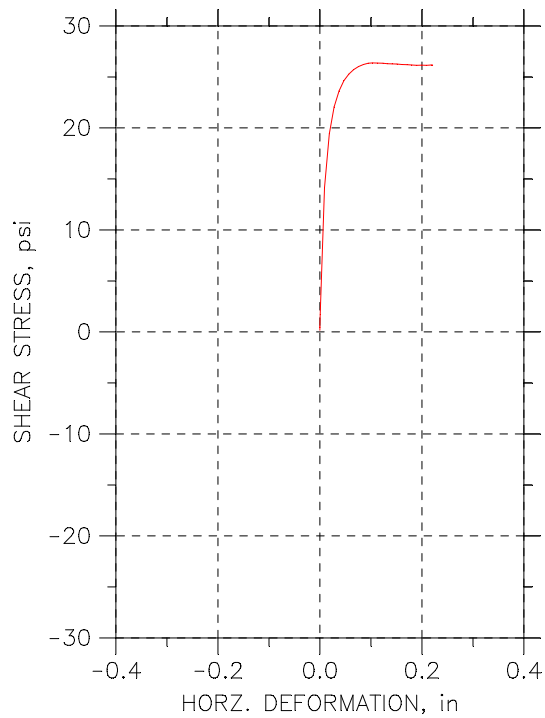
Step: 3 of 3

Stress: 100 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/7/07	Depth: 57.2'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: E:\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI.dat		

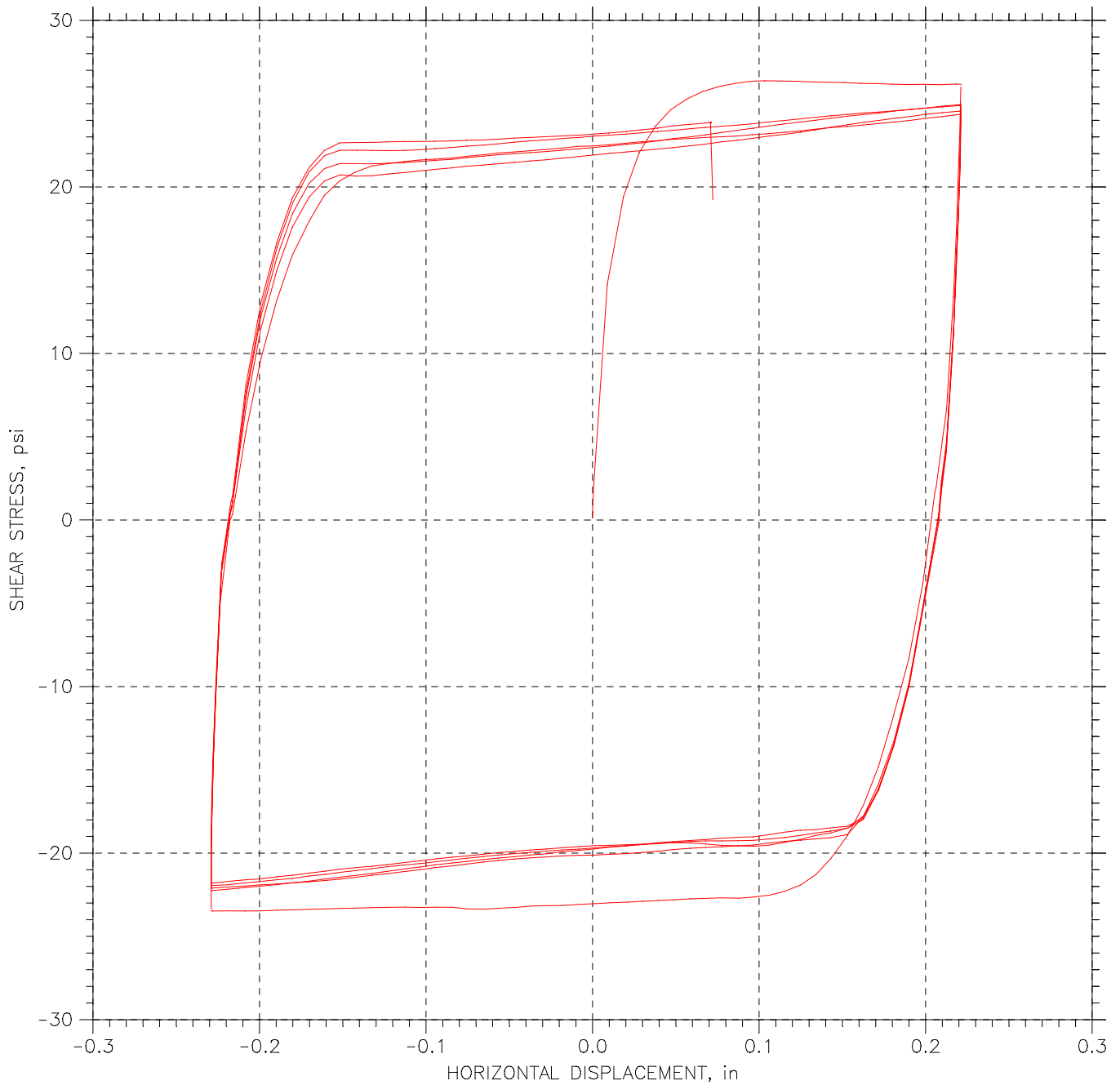
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-3			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	34.20		
	Dry Density, pcf	100.9		
	Saturation, %	137.81		
	Void Ratio	0.67014		
Consol. Height, in		0.93618		
Consol. Void Ratio		0.56355		
Final	Water Content, %	24.37		
	Dry Density, pcf	122.2		
	Saturation, %	173.71		
	Void Ratio	0.37882		
Normal Stress, psi		99.975		
Max. Shear Stress, psi		26.375		
Res. Shear Stress, psi		26.168		
Time to Failure, min		12.003		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		65		
Plastic Limit		28		
Plasticity Index		37		

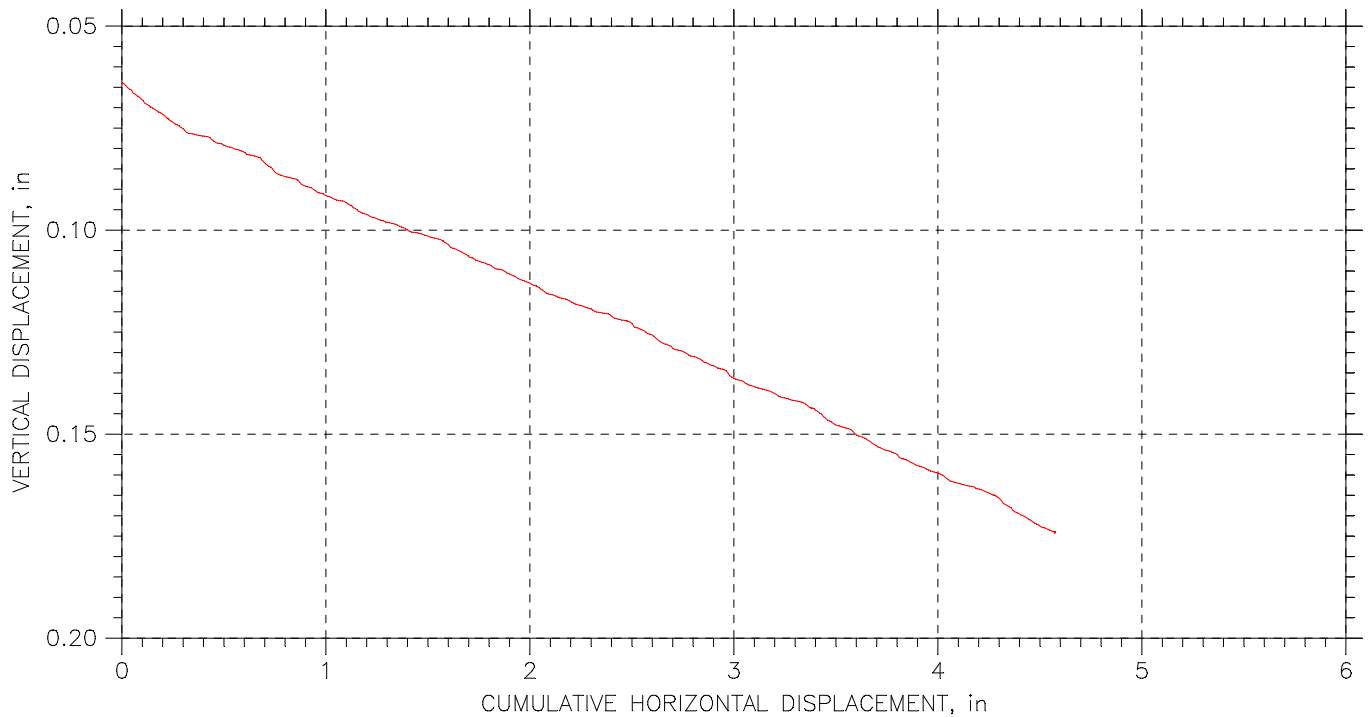
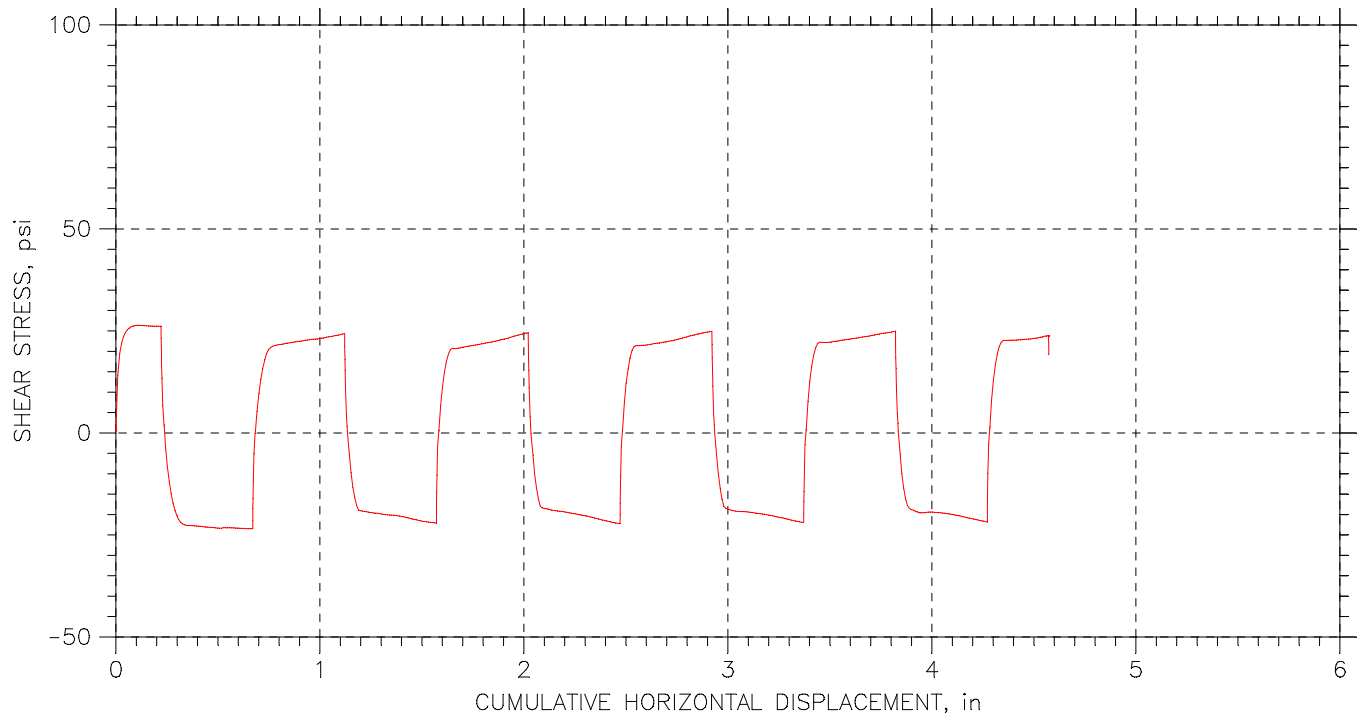
Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-2A
 Sample Type: Pitcher
 Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)
 Remarks: Constant Load (Sample allowed to swell before shearing)

RESIDUAL SHEAR TEST



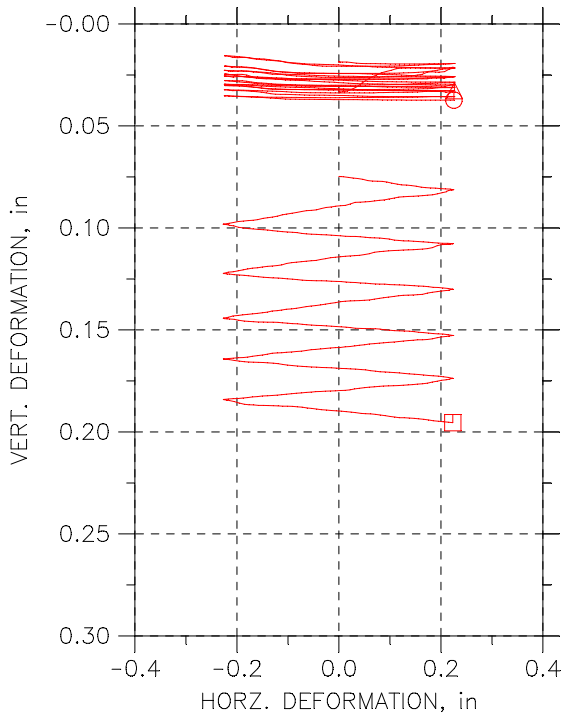
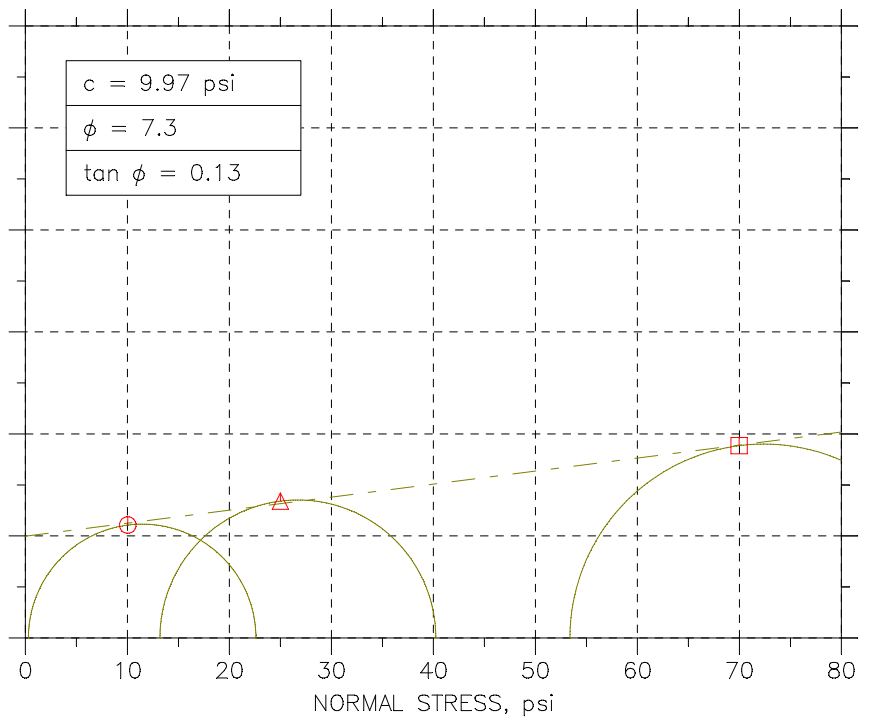
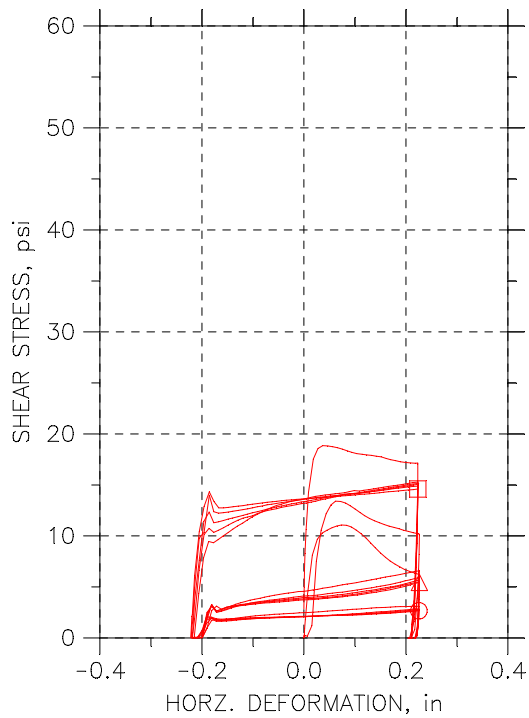
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/7/07	Depth: 57.2'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: E:\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI.dat		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-2A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/7/07	Depth: 57.2'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Reddish Brown Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: E:\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-2 P-3 100PSI.dat		

DIRECT SHEAR TEST REPORT



Symbol	⊙	△	□	
Test No.	A-1	A-2	A-3	
Sample No.	P-1	P-1	P-1	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	30.18	28.75	33.07
	Dry Density, pcf	97.119	98.428	95.093
	Saturation, %	110.79	108.95	115.58
	Void Ratio	0.73555	0.71248	0.77254
Consol. Height, in		0.96669	0.98143	0.92631
Consol. Void Ratio		0.67774	0.68067	0.64193
Final	Water Content, %	31.23	29.28	30.93
	Dry Density, pcf	100.89	101.76	118.19
	Saturation, %	125.72	120.45	195.99
	Void Ratio	0.67071	0.65645	0.42612
Normal Stress, psi		10.033	24.998	69.977
Max. Shear Stress, psi		11.063	13.415	18.847
Shear Stress, psi		2.6582	5.4406	14.599
Time to Failure, min		8.0032	7.0034	4.0037
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		63	63	63
Plastic Limit		27	27	27
Plasticity Index		36	36	36

Project: Purple Line

Location: College Park, MD

Project No.: 14961

Boring No.: CP-3A

Sample Type: Pitcher

Description: Mottled Red, Dark Brown, and Gray Stiff to very Stiff Clay with traces of fine Sand (CH)

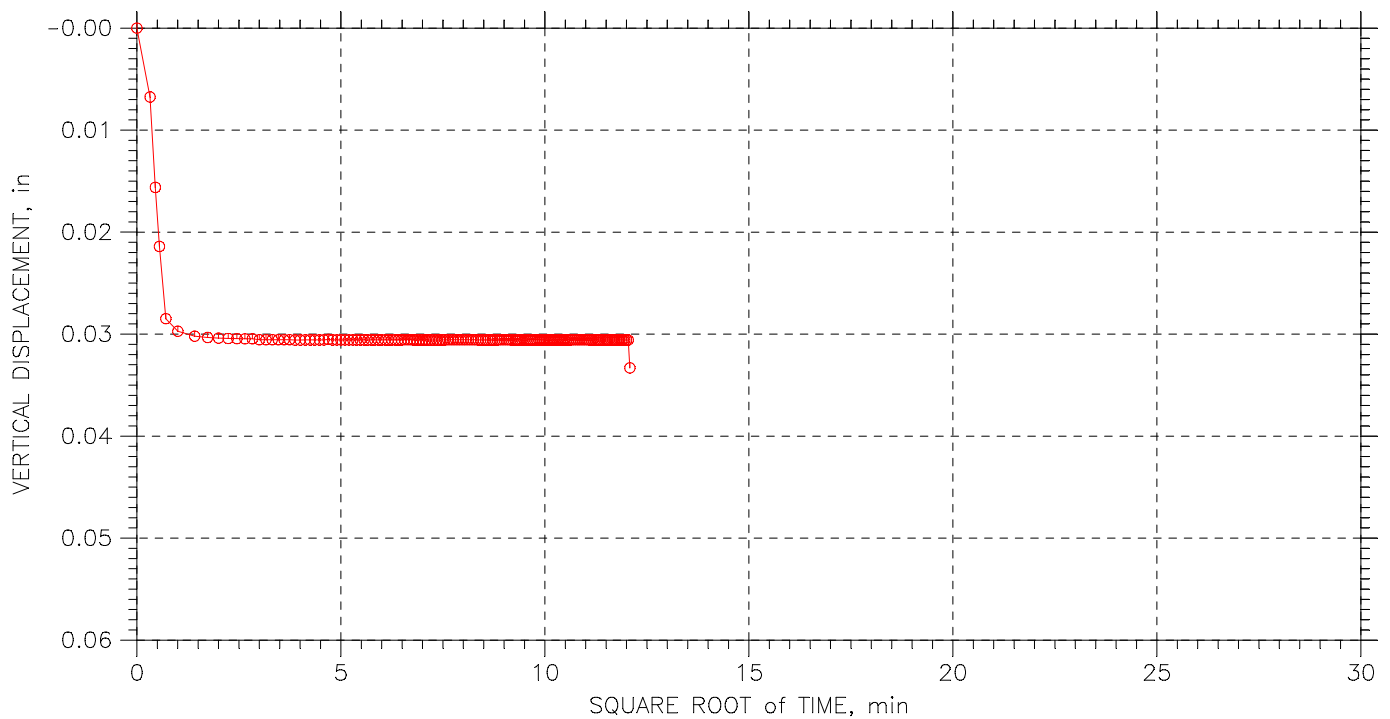
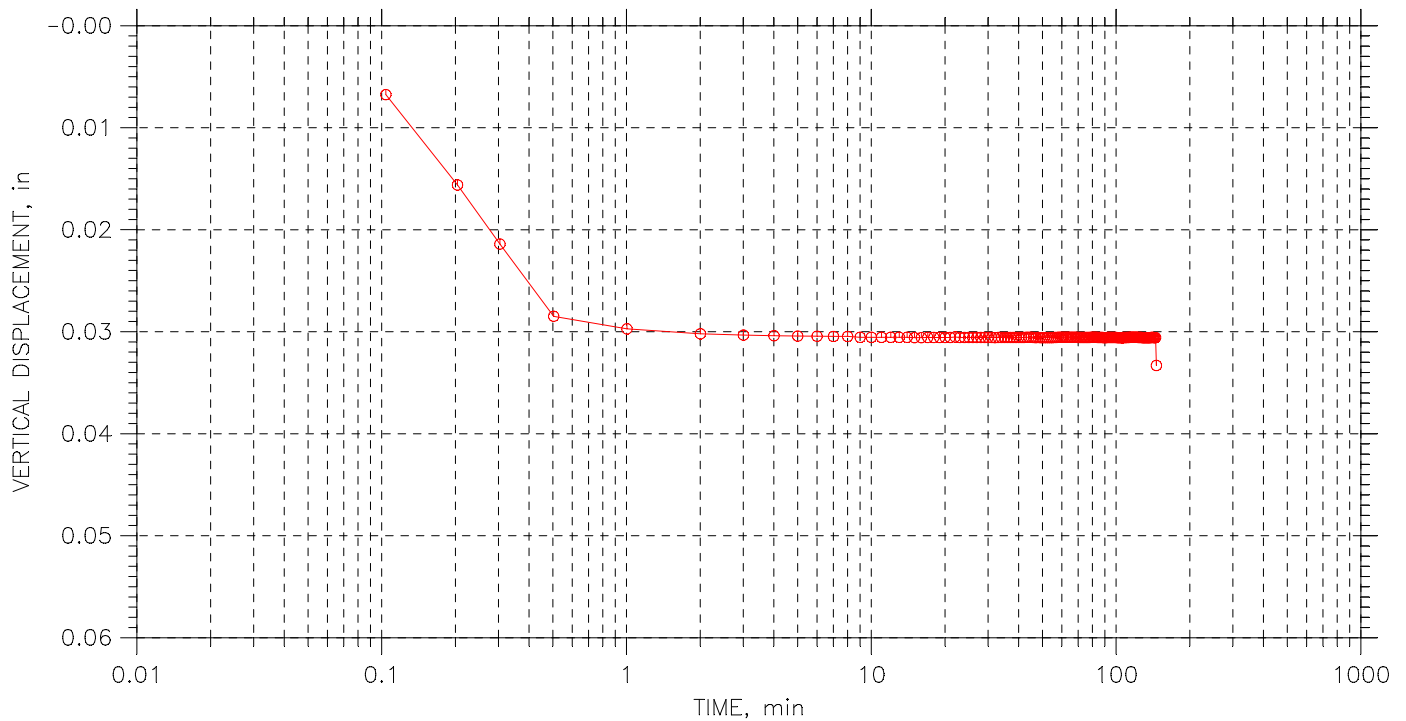
Remarks: Constant Volume (No swell allowed prior to shear)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

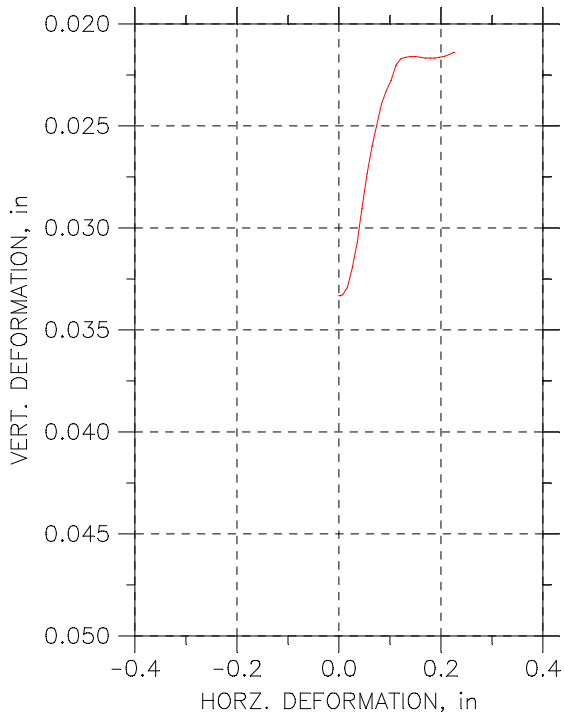
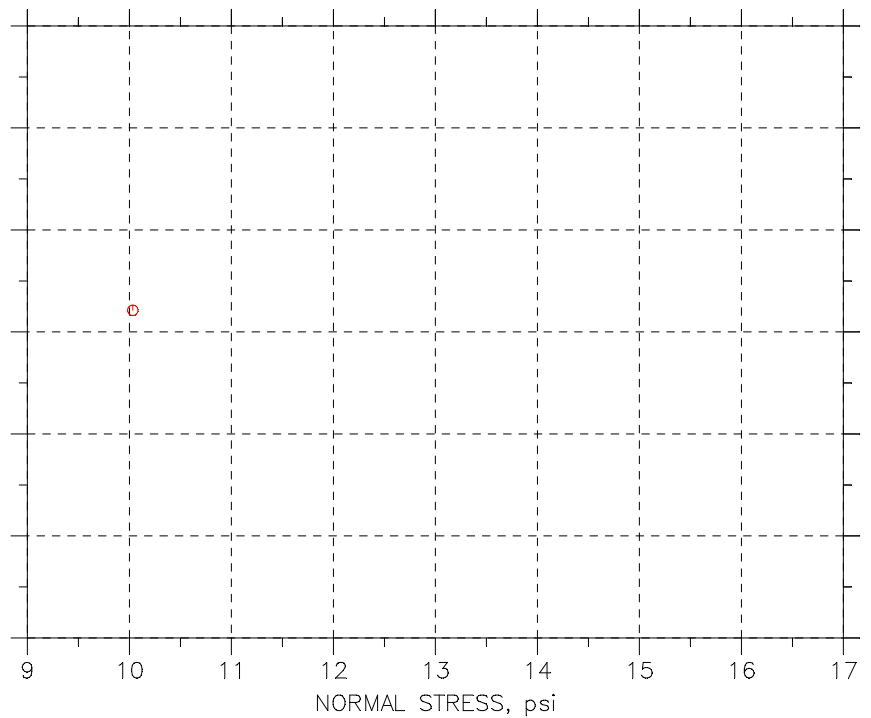
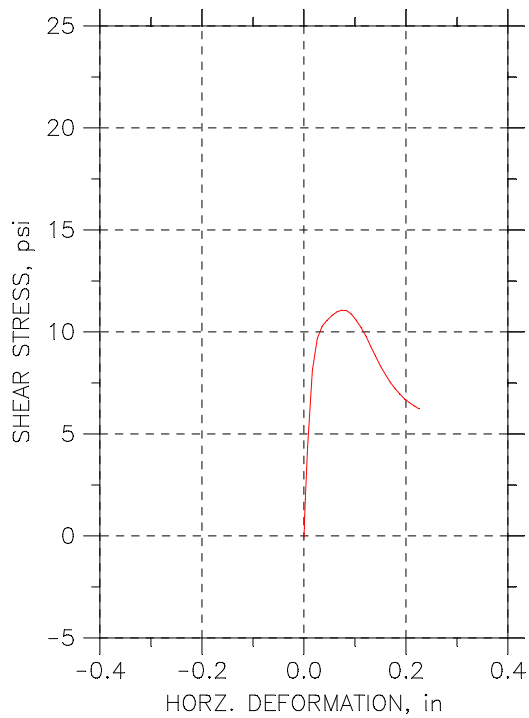
Step: 1 of 1

Stress: 10 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys	Checked By: Bert
Sample No.: P-1	Test Date: 8/14/07	Depth: 28.9'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Mottled Red,Dark Brown, and Gray Stiff to very Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

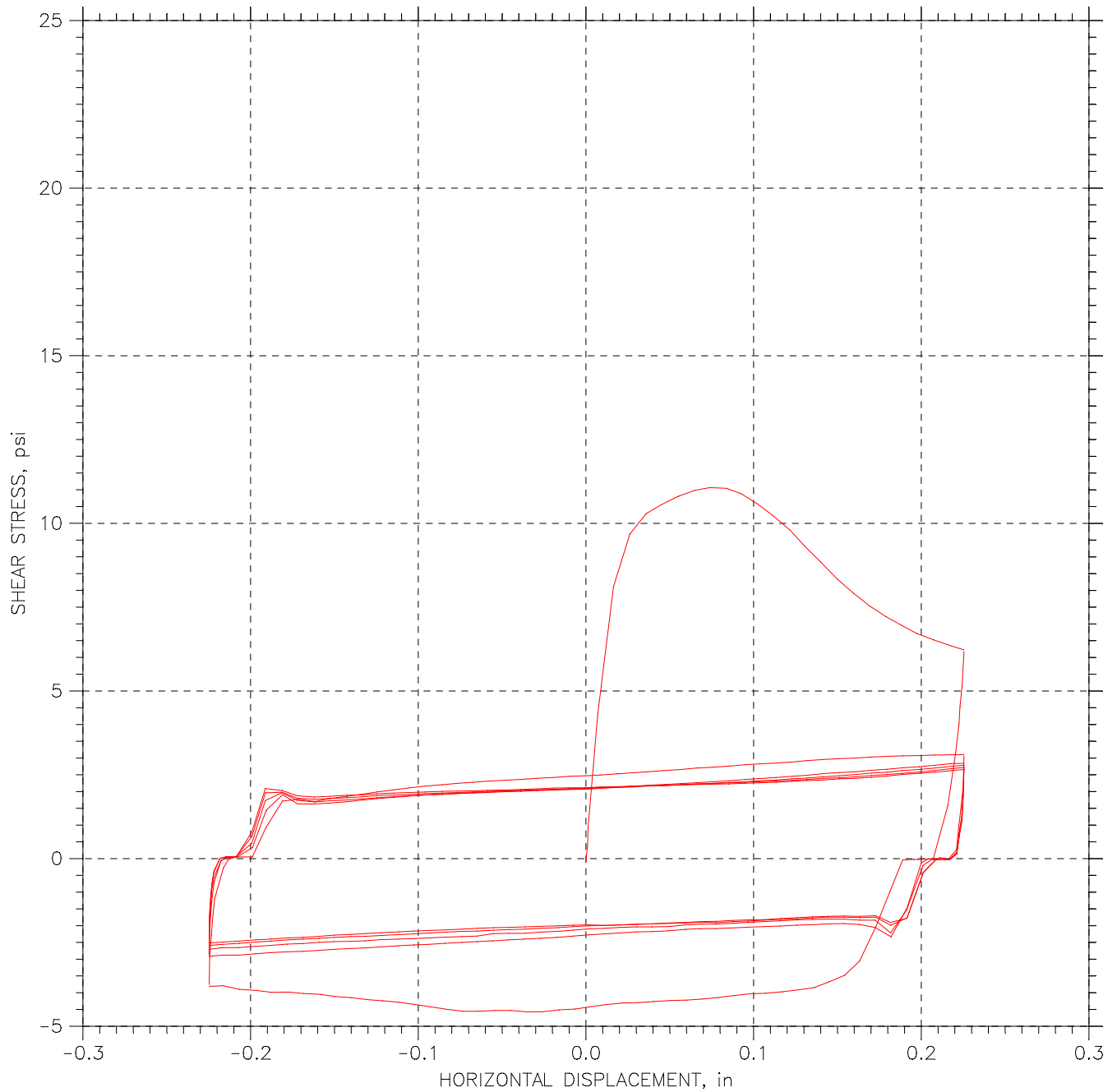
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-1			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	30.18		
	Dry Density, pcf	97.12		
	Saturation, %	110.79		
	Void Ratio	0.73555		
Consol. Height, in		0.96669		
Consol. Void Ratio		0.67774		
Final	Water Content, %	31.23		
	Dry Density, pcf	100.9		
	Saturation, %	125.72		
	Void Ratio	0.67071		
Normal Stress, psi		10.033		
Max. Shear Stress, psi		11.063		
Ult. Shear Stress, psi		6.2273		
Time to Failure, min		8.0032		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		63		
Plastic Limit		27		
Plasticity Index		36		

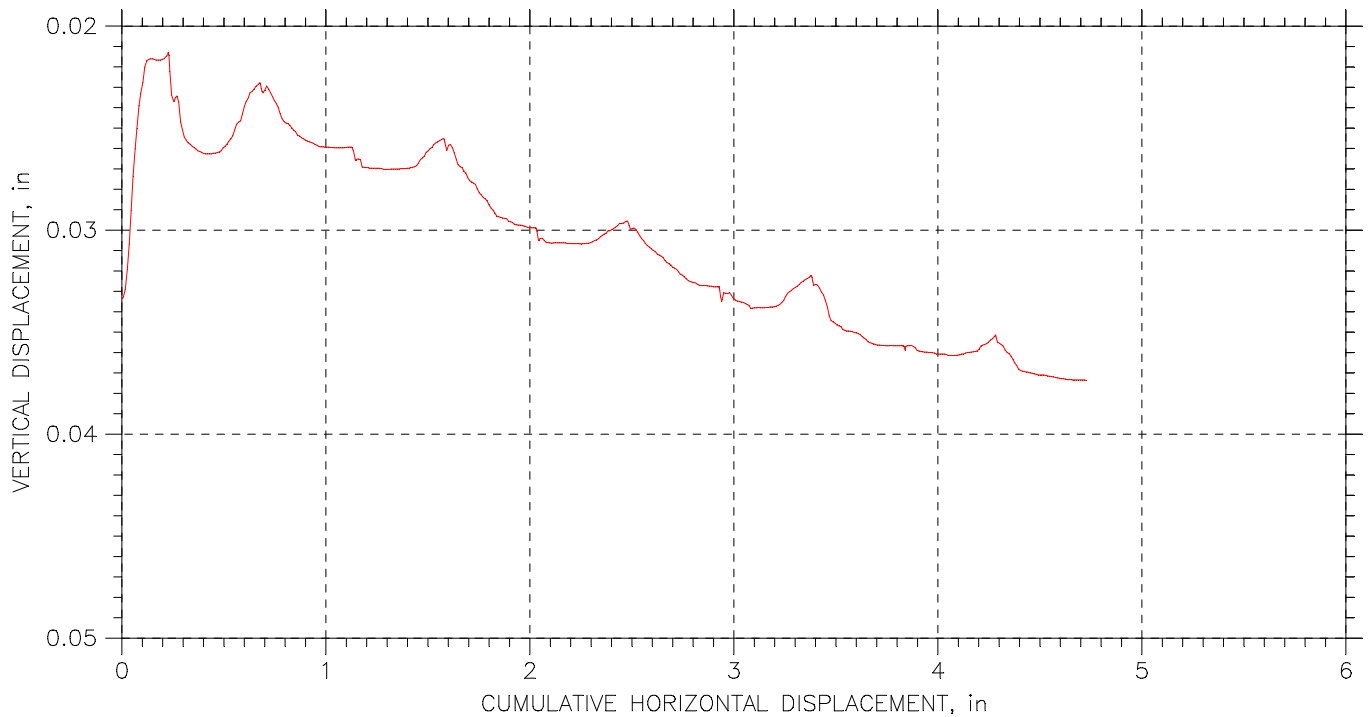
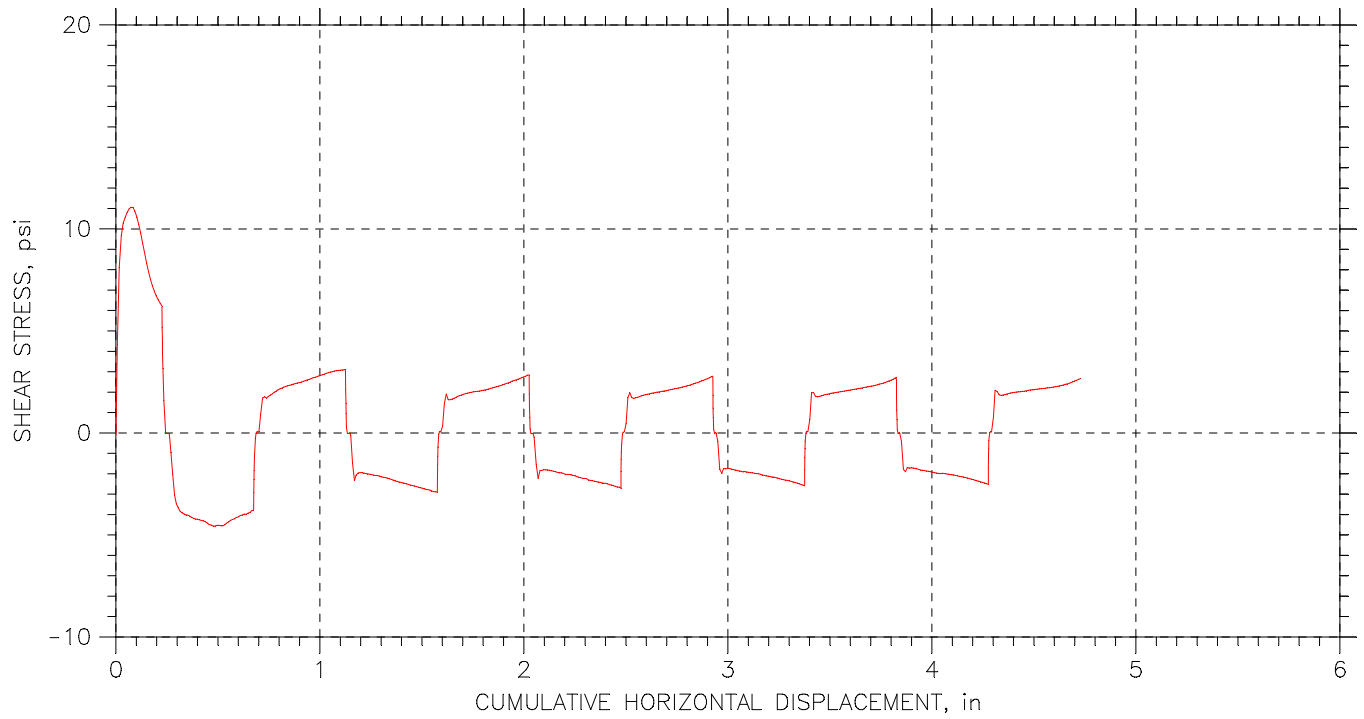
Project: Purple Line	
Location: College Park,MD	
Project No.: 14961	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Mottled Red,Dark Brown, and Gray Stiff to very Stiff Clay with traces of fine Sand (CH)	
Remarks: Constant Volume (No swell allowed prior to shear)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys	Checked By: Bert
Sample No.: P-1	Test Date: 8/14/07	Depth: 28.9'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Mottled Red,Dark Brown, and Gray Stiff to very Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

RESIDUAL SHEAR TEST



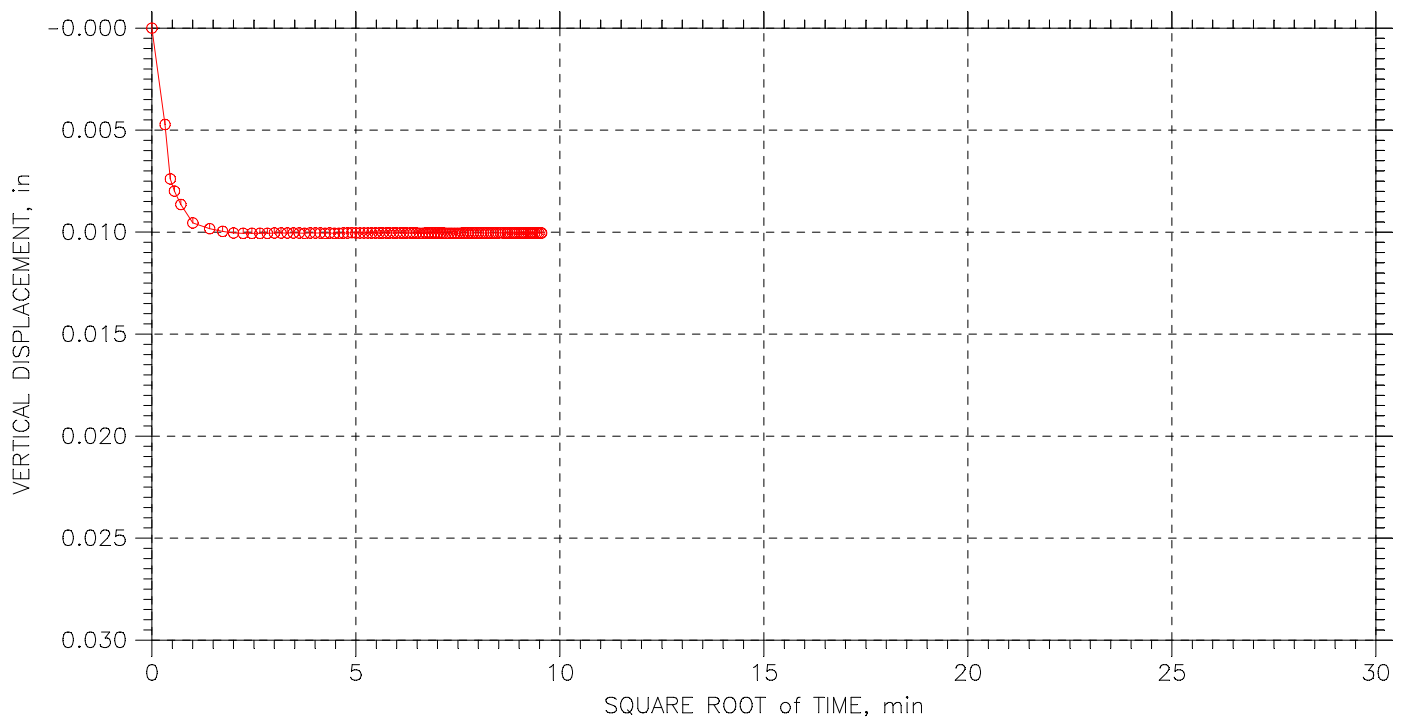
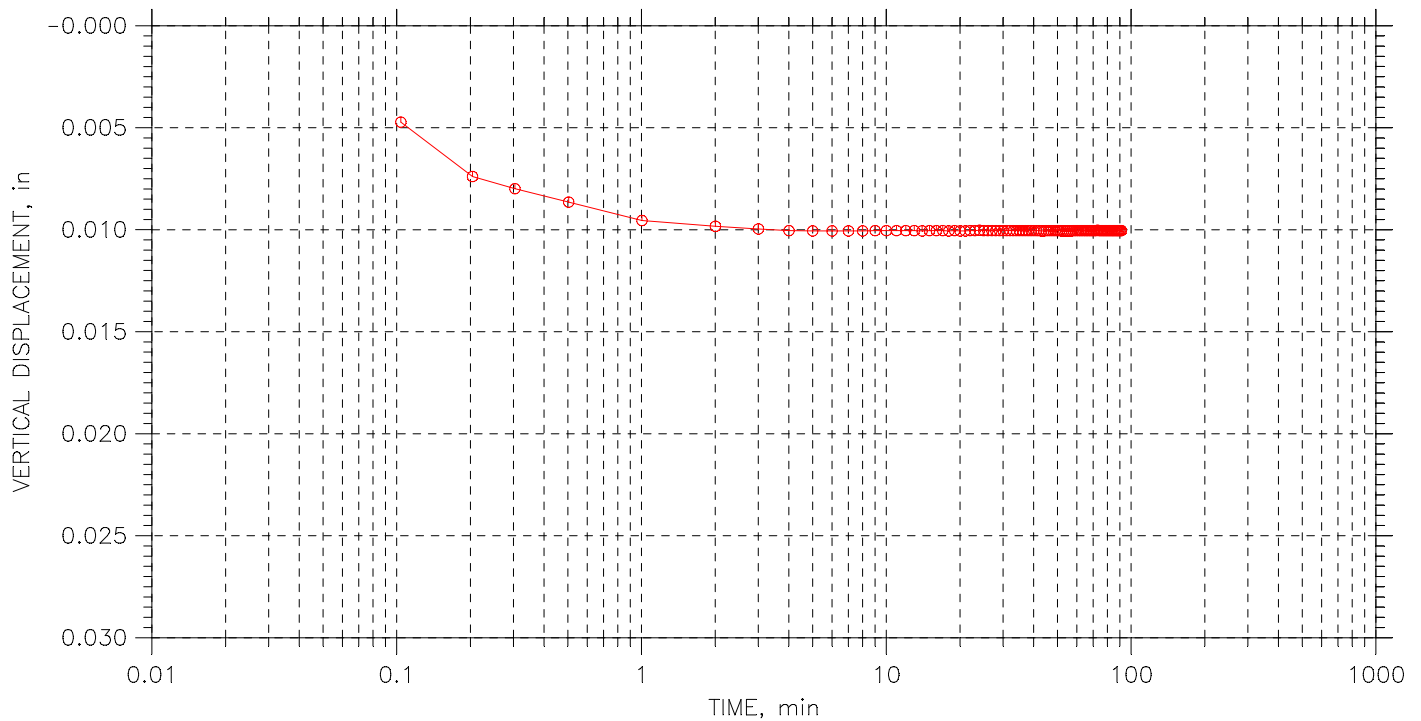
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys	Checked By: Bert
Sample No.: P-1	Test Date: 8/14/07	Depth: 28.9'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Mottled Red,Dark Brown, and Gray Stiff to very Stiff Clay with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 2

Stress: 10 psi



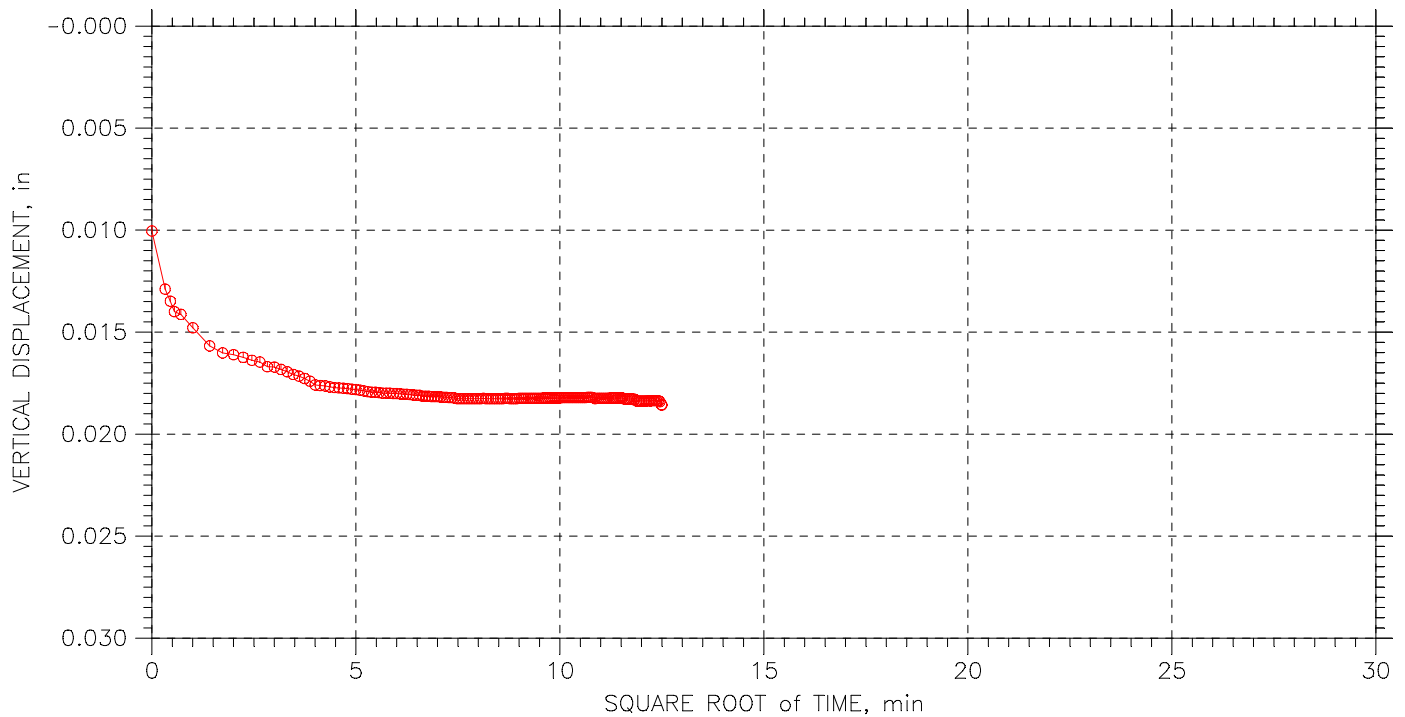
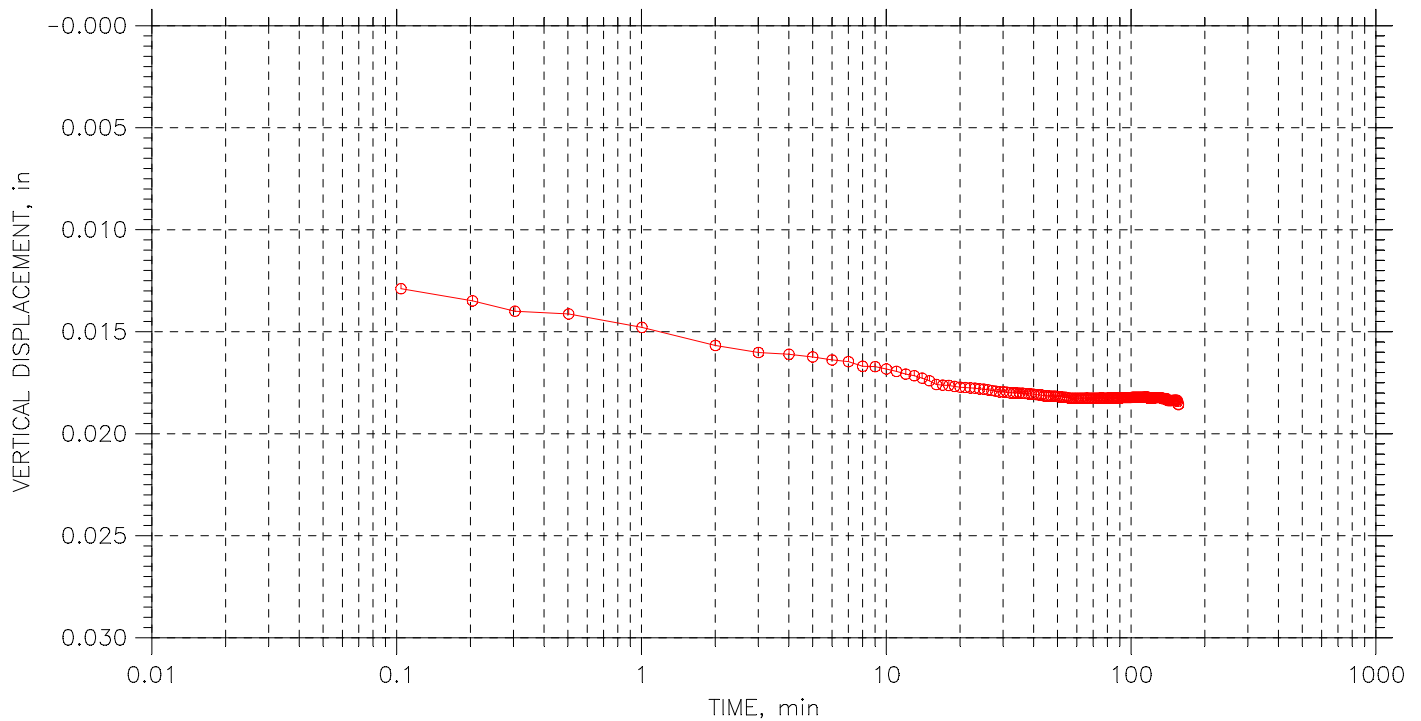
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/13/07	Depth: 29.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

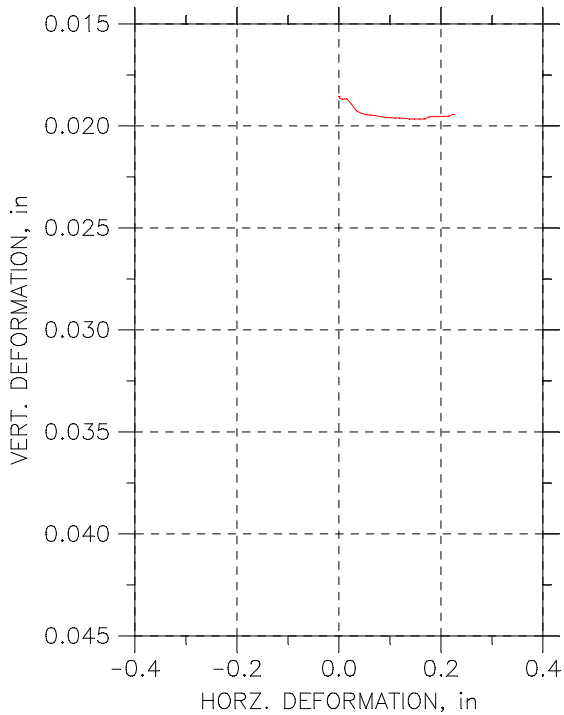
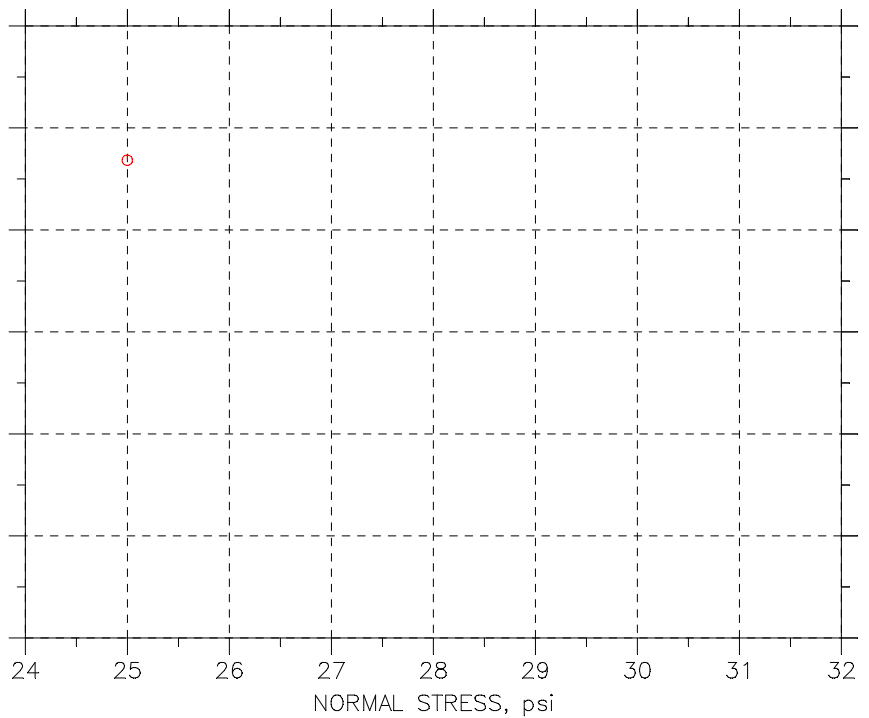
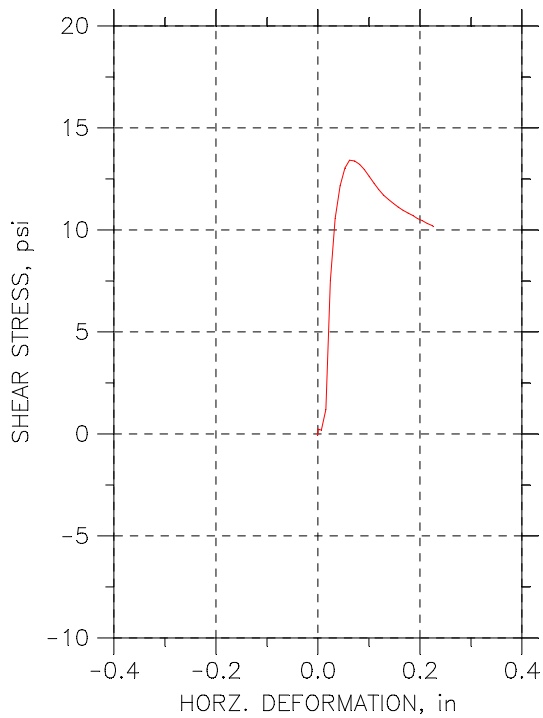
Step: 2 of 2

Stress: 25 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/13/07	Depth: 29.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

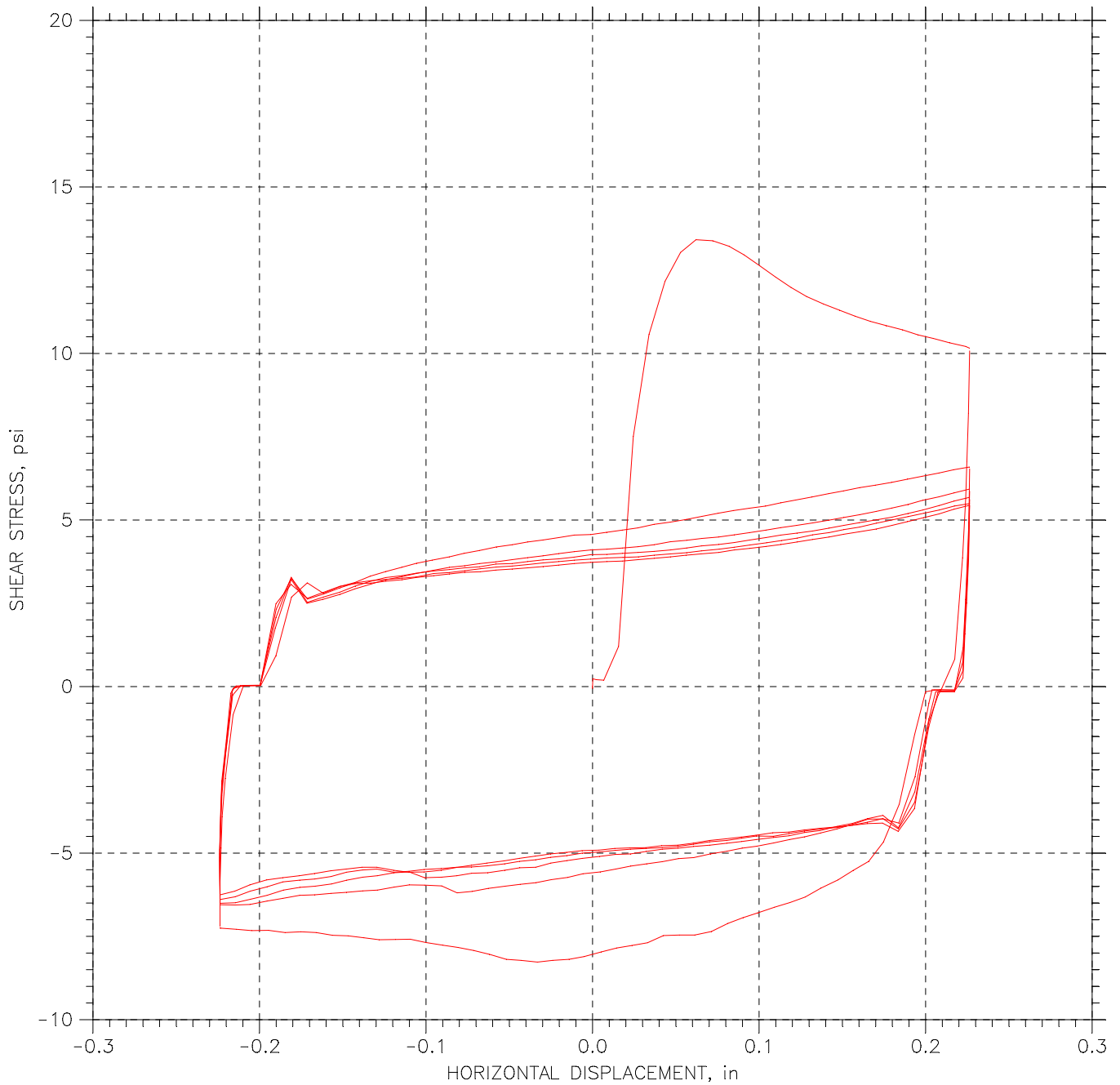
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-2			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	28.75		
	Dry Density, pcf	98.43		
	Saturation, %	108.95		
	Void Ratio	0.71248		
Consol. Height, in		0.98143		
Consol. Void Ratio		0.68067		
Final	Water Content, %	29.28		
	Dry Density, pcf	101.8		
	Saturation, %	120.45		
	Void Ratio	0.65645		
Normal Stress, psi		24.998		
Max. Shear Stress, psi		13.415		
Ult. Shear Stress, psi		10.161		
Time to Failure, min		7.0034		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		63		
Plastic Limit		27		
Plasticity Index		36		

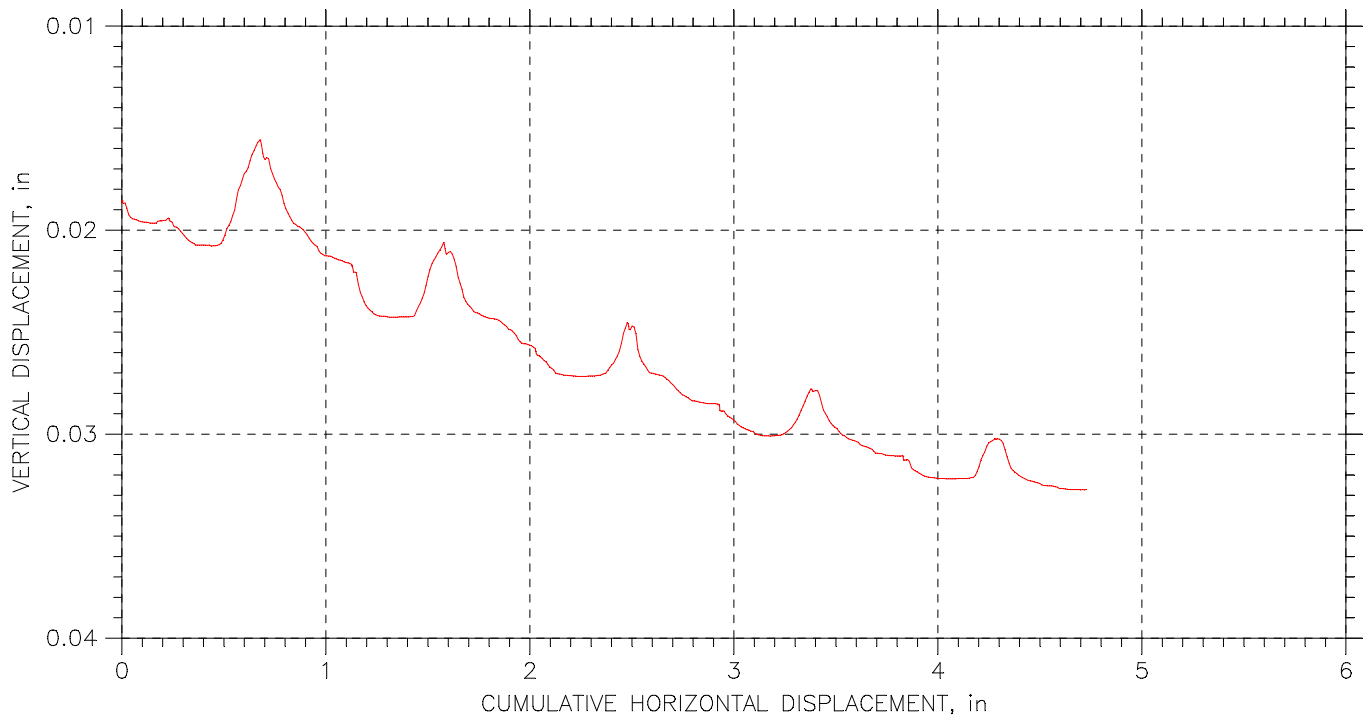
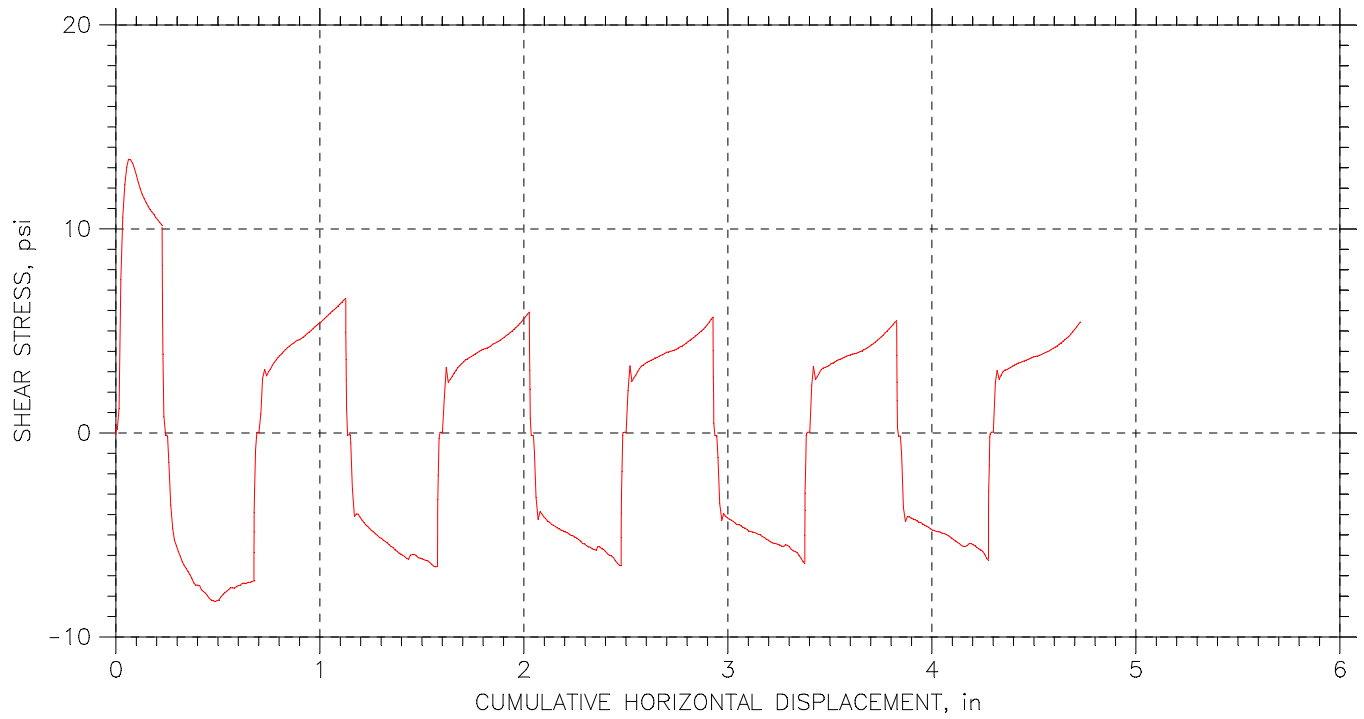
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)	
Remarks: Constant Volume (No swell allowed prior to shear)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/13/07	Depth: 29.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

RESIDUAL SHEAR TEST



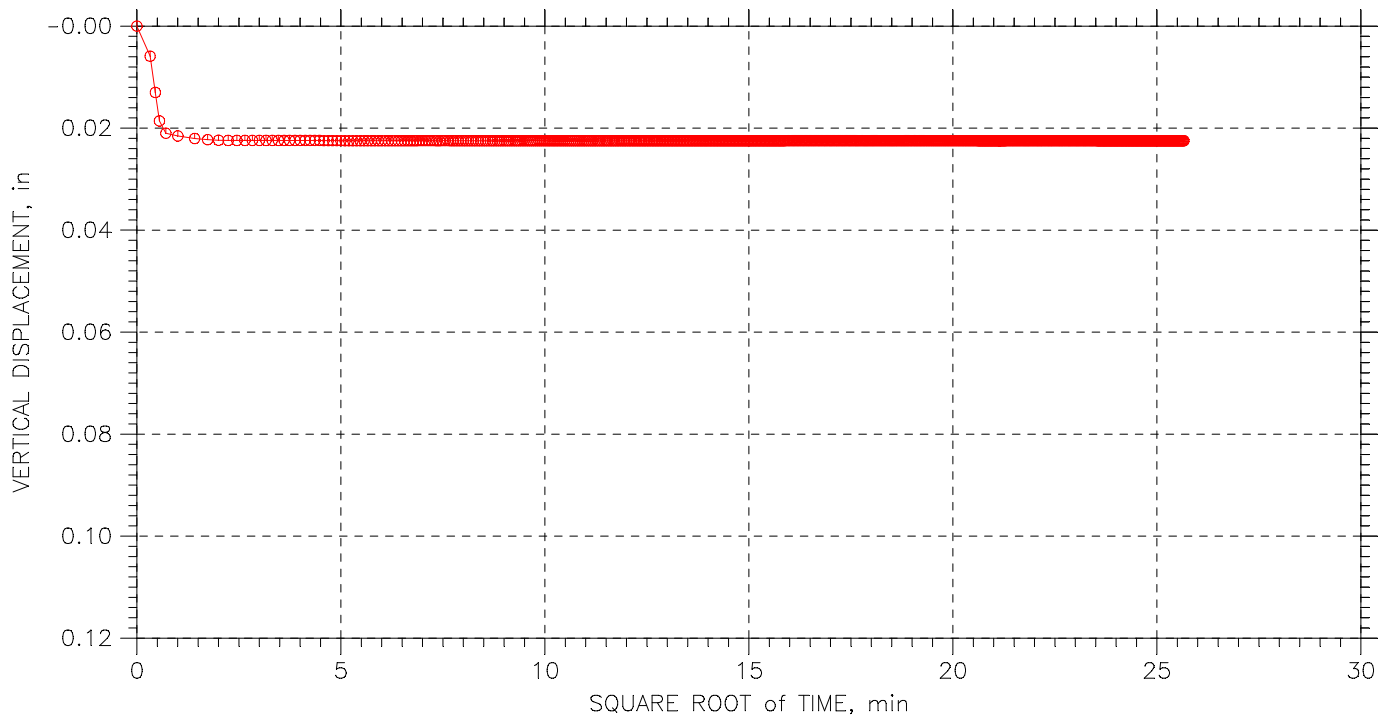
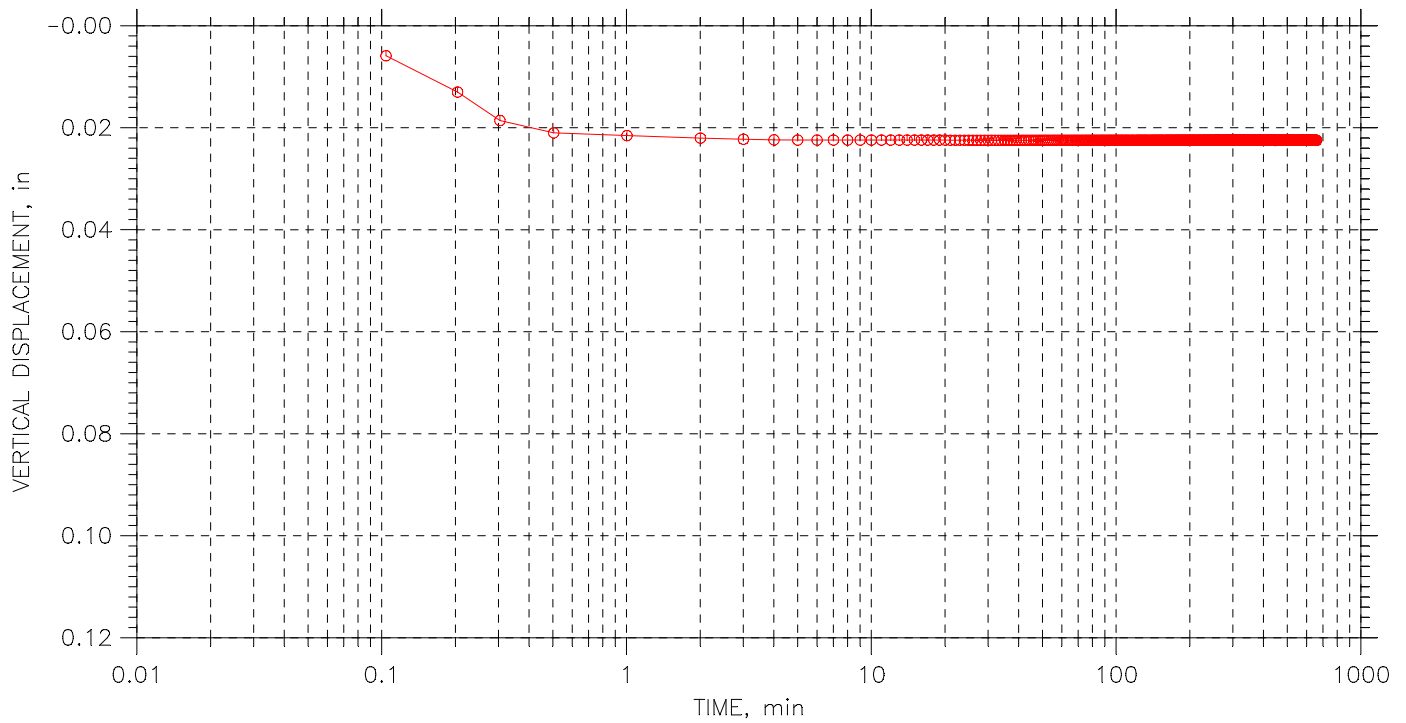
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/13/07	Depth: 29.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 3

Stress: 10 psi



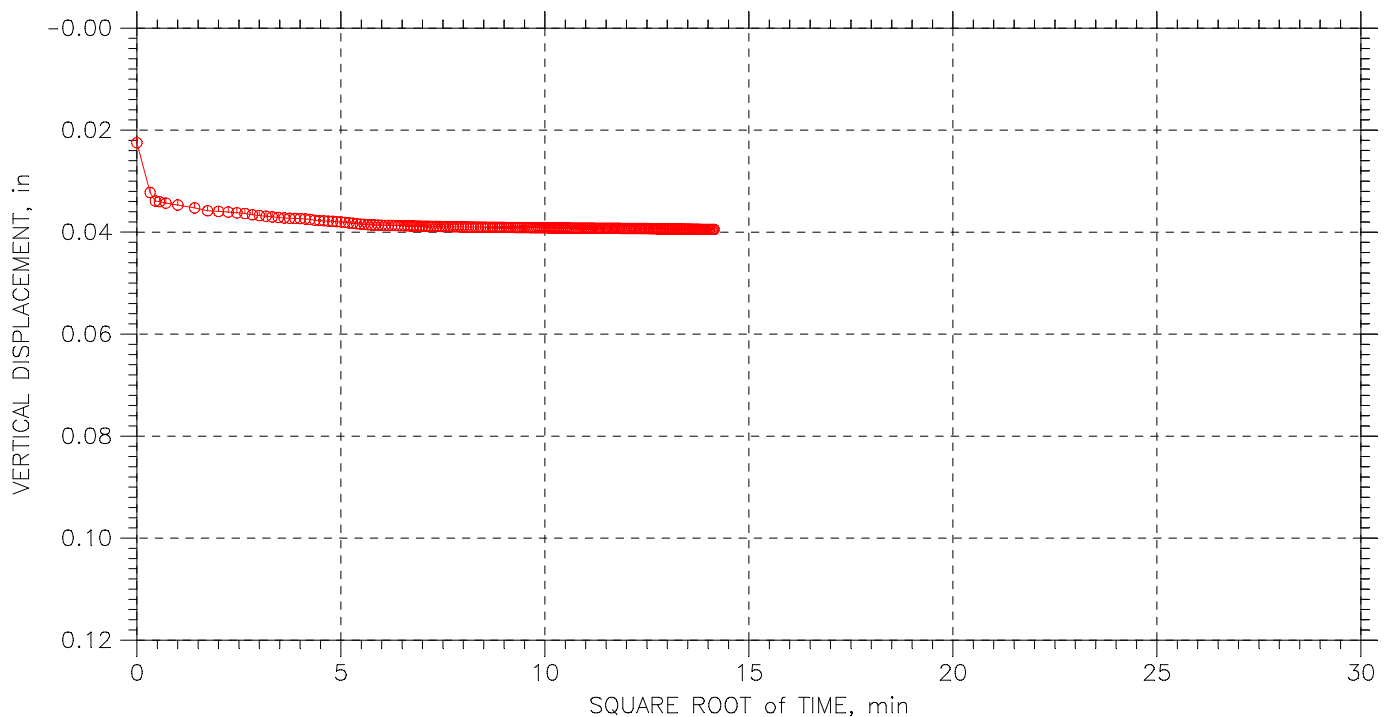
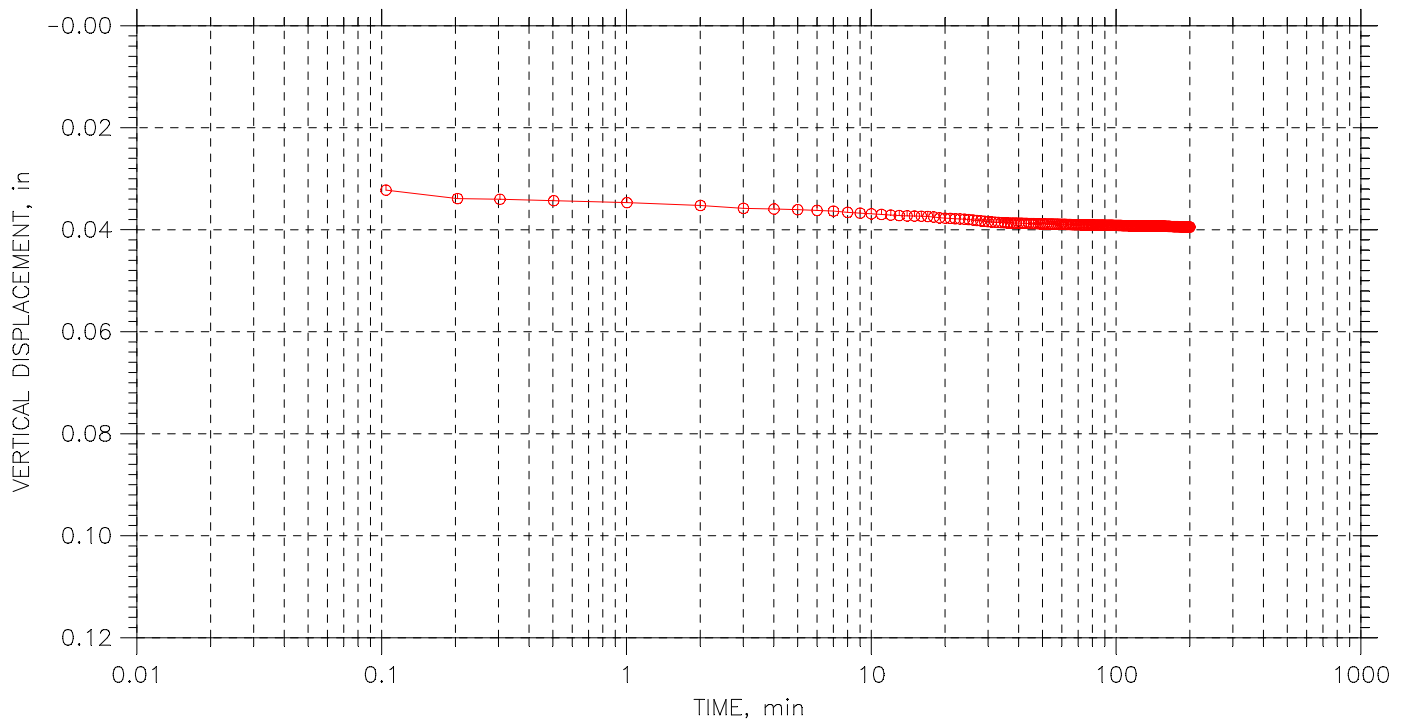
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/9/07	Depth: 29.3'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray,Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 2 of 3

Stress: 25 psi



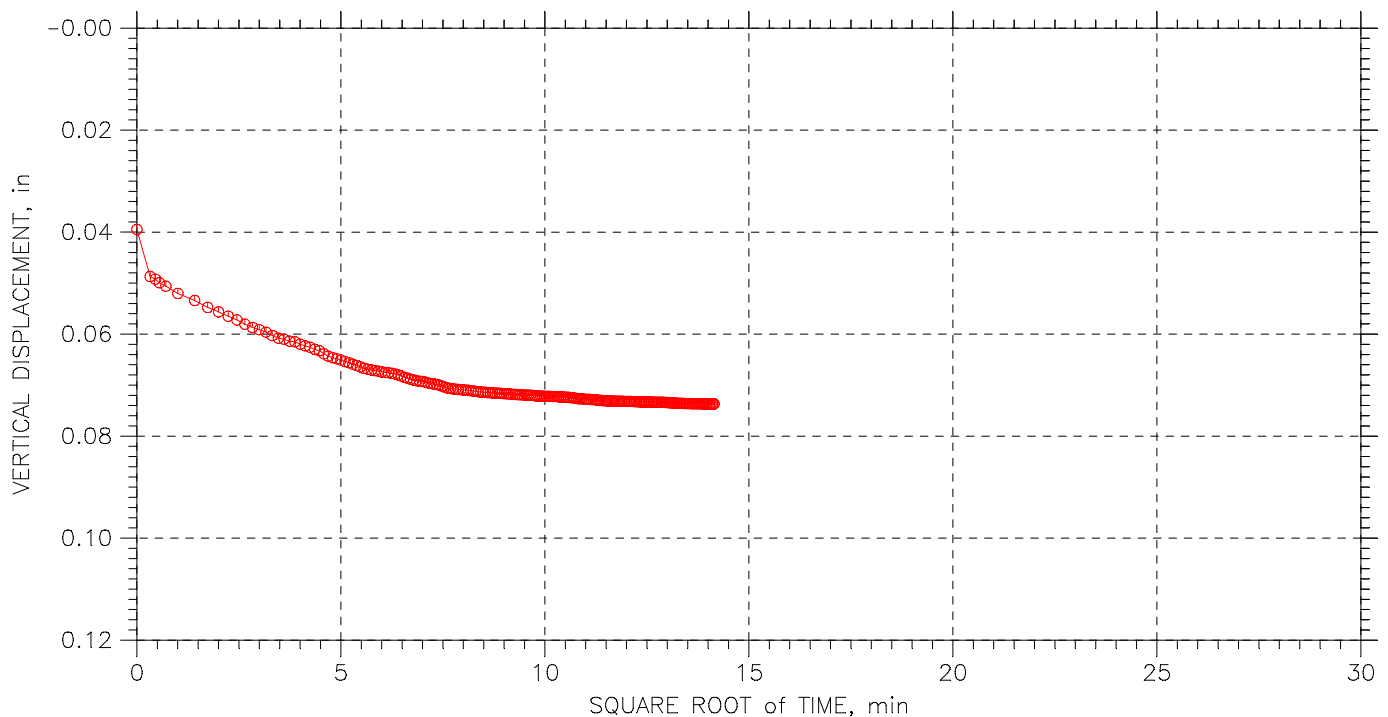
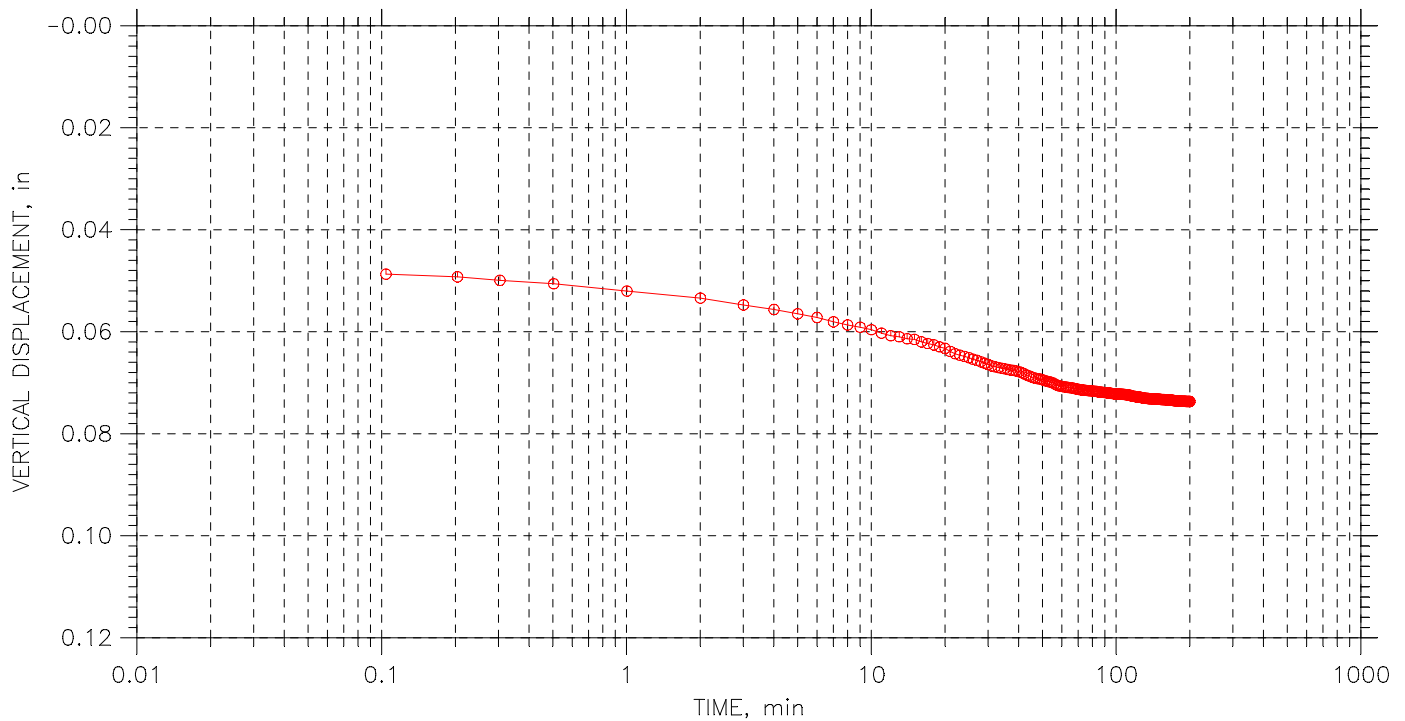
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/9/07	Depth: 29.3'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray,Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

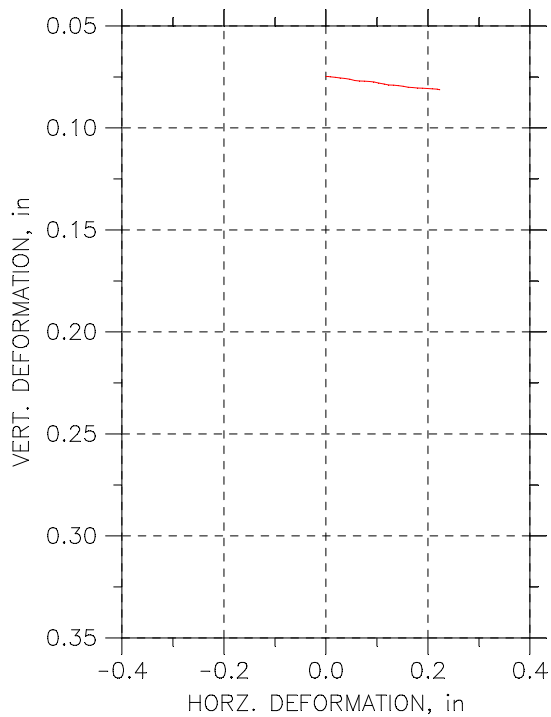
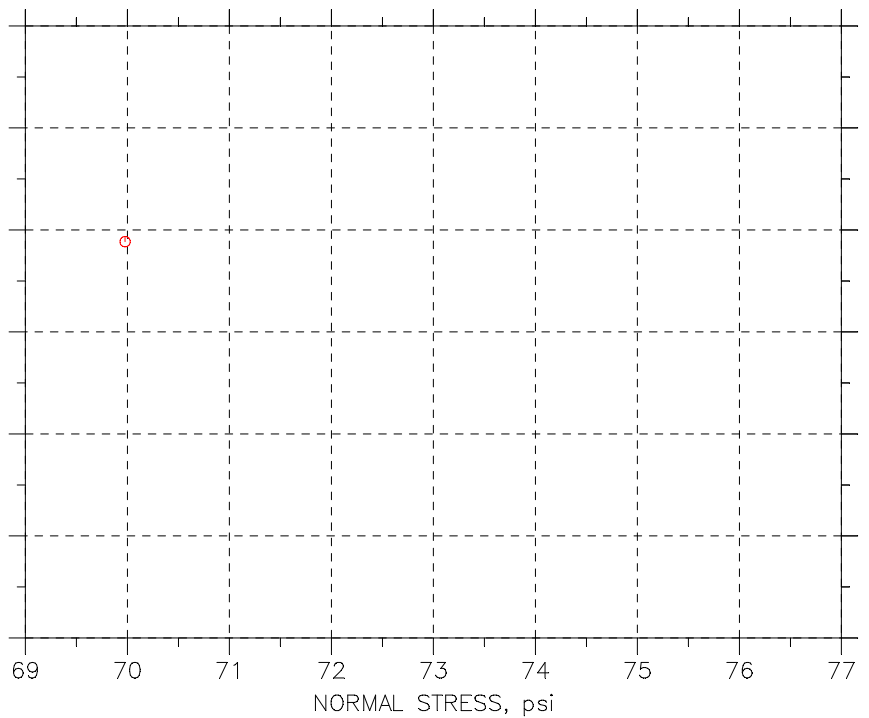
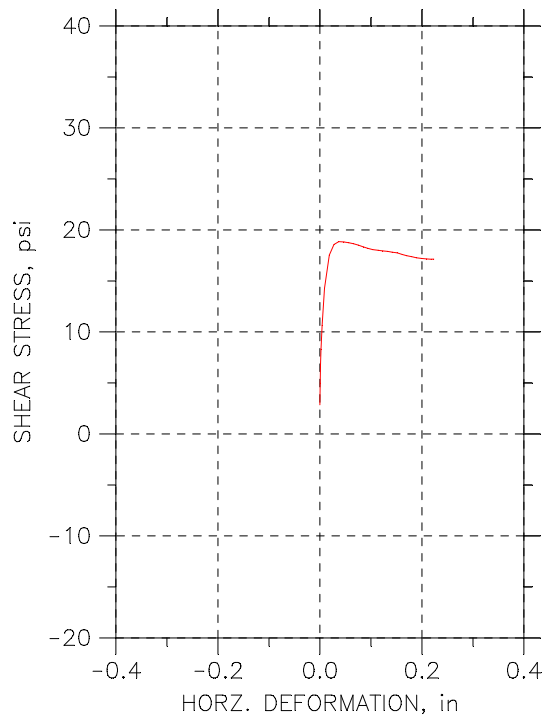
Step: 3 of 3

Stress: 70 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/9/07	Depth: 29.3'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray,Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

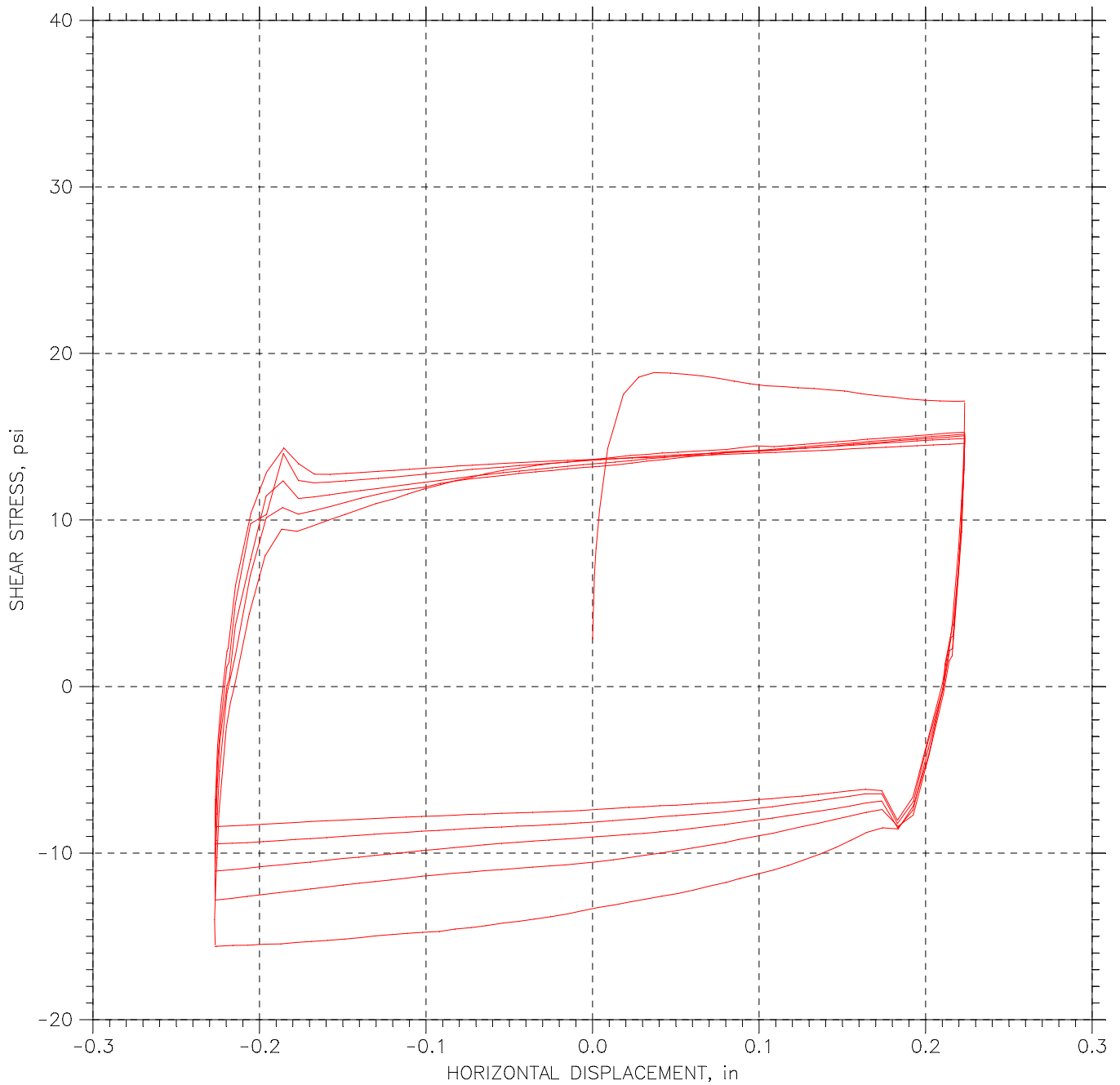
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-3			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	33.07		
	Dry Density, pcf	95.09		
	Saturation, %	115.58		
	Void Ratio	0.77254		
Consol. Height, in		0.92631		
Consol. Void Ratio		0.64193		
Final	Water Content, %	30.93		
	Dry Density, pcf	118.2		
	Saturation, %	195.99		
	Void Ratio	0.42612		
Normal Stress, psi		69.977		
Max. Shear Stress, psi		18.847		
Ult. Shear Stress, psi		17.142		
Time to Failure, min		4.0037		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		63		
Plastic Limit		27		
Plasticity Index		36		

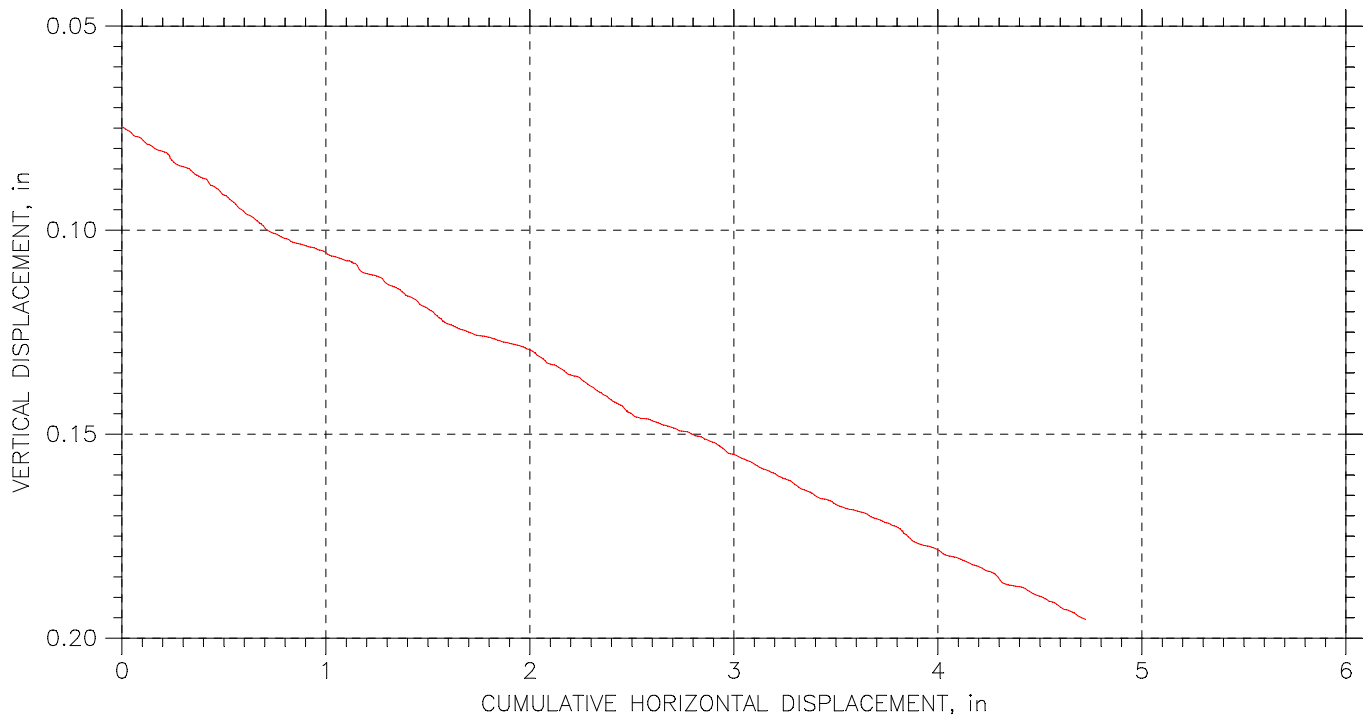
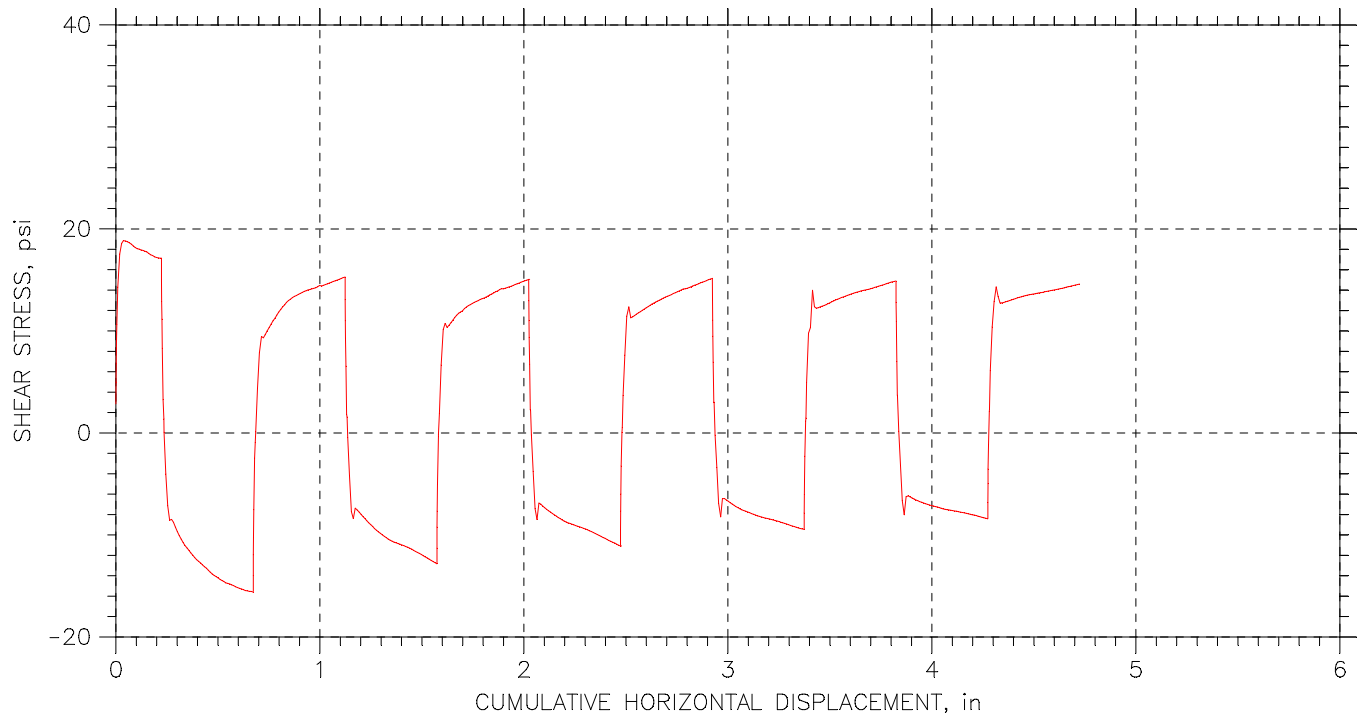
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Mottled Red, Dark Brown and Gray, Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)	
Remarks: Constant Volume (No swell allowed prior to shear)	

RESIDUAL SHEAR TEST



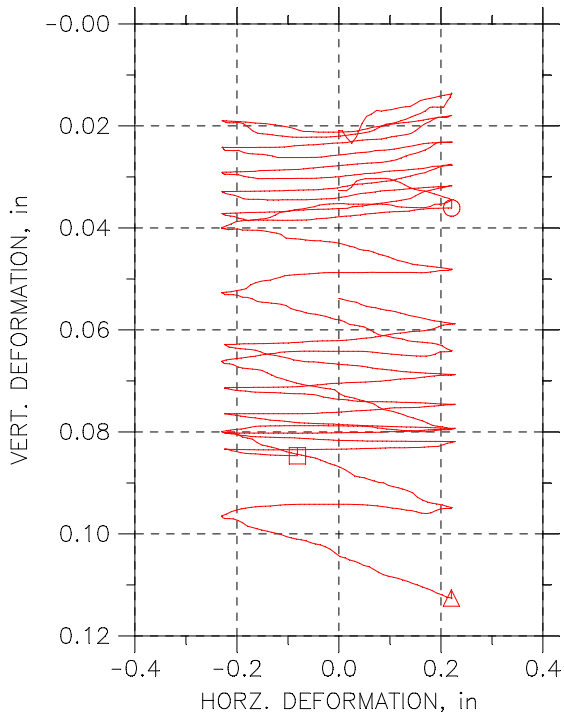
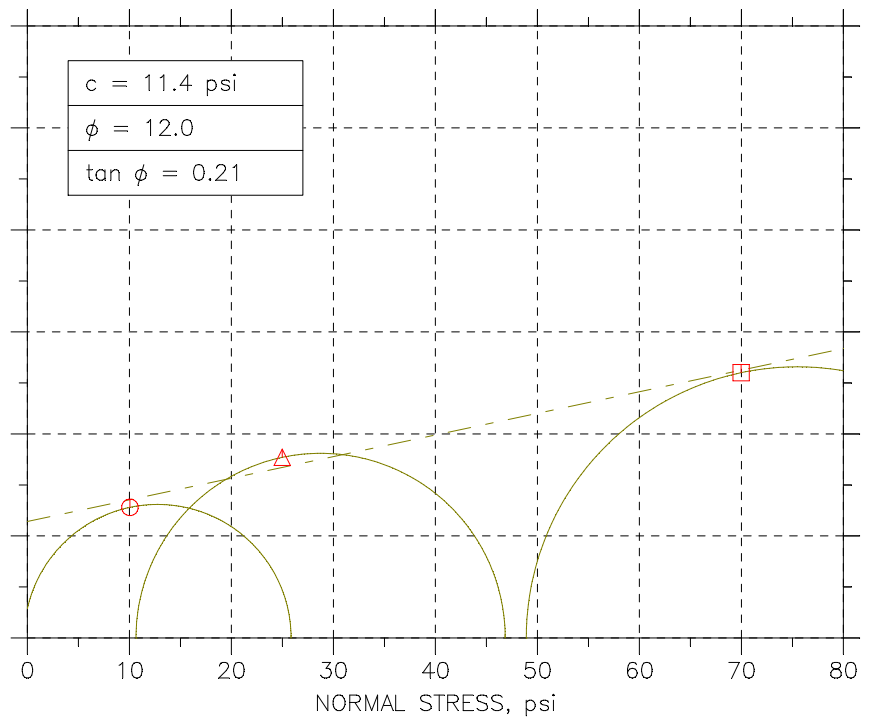
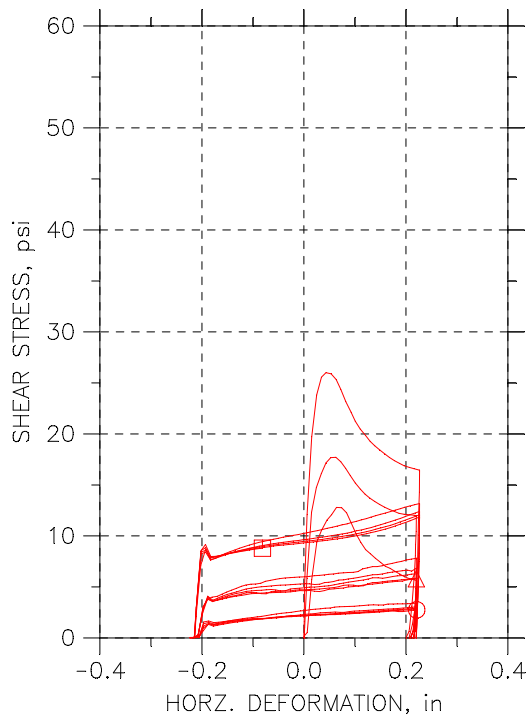
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/9/07	Depth: 29.3'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray,Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Sam	Checked By: Bert
Sample No.: P-1	Test Date: 8/9/07	Depth: 29.3'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray,Medium Stiff to Very Stiff CLAY with traces of fine Sand (CH)		
Remarks: Constant Volume (No swell allowed prior to shear)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST REPORT



Symbol		⊙	△	□	
Test No.		B-1	B-2	B-3	
Sample No.		P-1	P-1	P-1	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75	
	Area, in ²	5.9396	5.9396	5.9396	
	Height, in	1	1	1	
	Water Content, %	33.02	38.85	29.95	
	Dry Density, pcf	94.733	90.943	97.107	
	Saturation, %	114.41	122.92	109.92	
	Void Ratio	0.77926	0.85342	0.73578	
Consol. Height, in		0.98075	0.96733	0.94622	
Consol. Void Ratio		0.74501	0.79287	0.64243	
Final	Water Content, %	31.90	30.16	27.08	
	Dry Density, pcf	98.281	102.48	106.09	
	Saturation, %	120.46	126.31	124.18	
	Void Ratio	0.71504	0.6448	0.58878	
Normal Stress, psi		10.05	24.989	69.977	
Max. Shear Stress, psi		12.802	17.705	26.002	
Shear Stress, psi		2.7493	5.7967	8.8027	
Time to Failure, min		7.0034	7.0034	5.0036	
Disp. Rate, in/min		0.01	0.01	0.01	
Estimated Specific Gravity		2.70	2.70	2.70	
Liquid Limit		63	63	63	
Plastic Limit		27	27	27	
Plasticity Index		36	36	36	

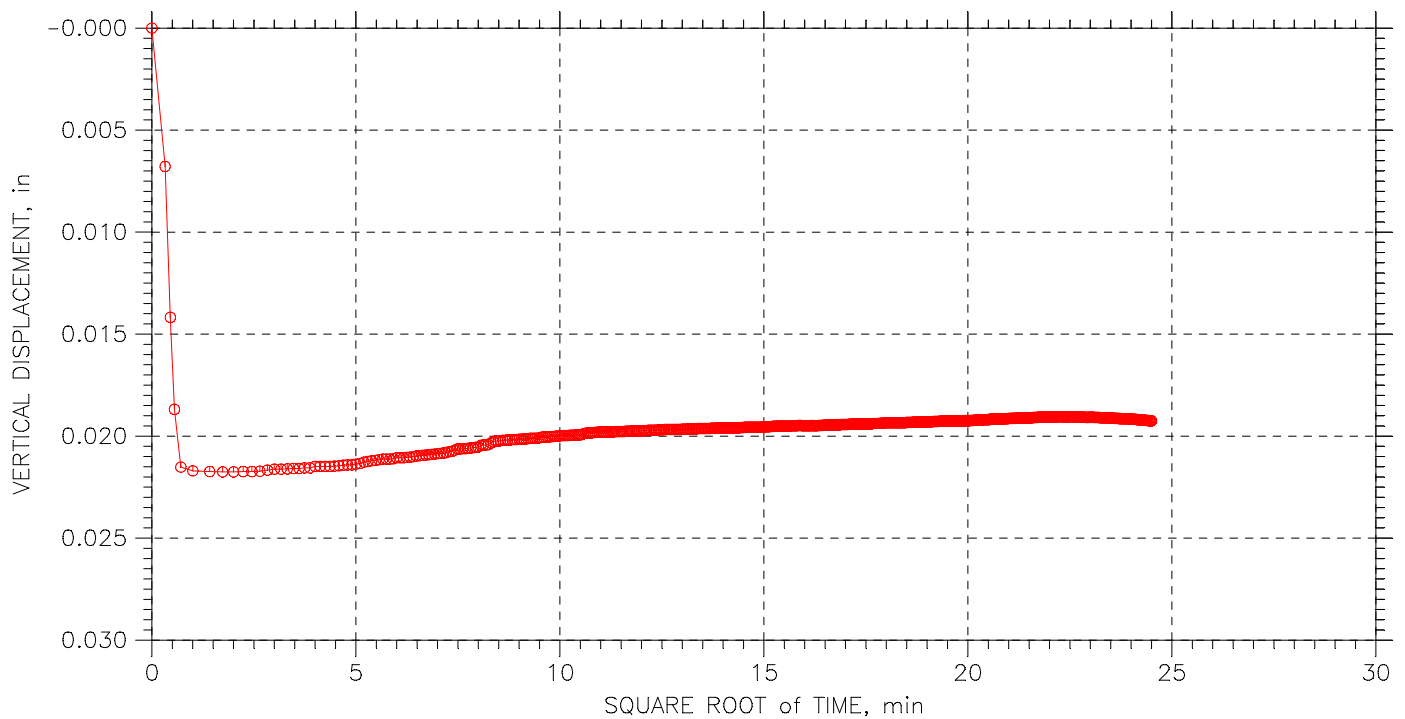
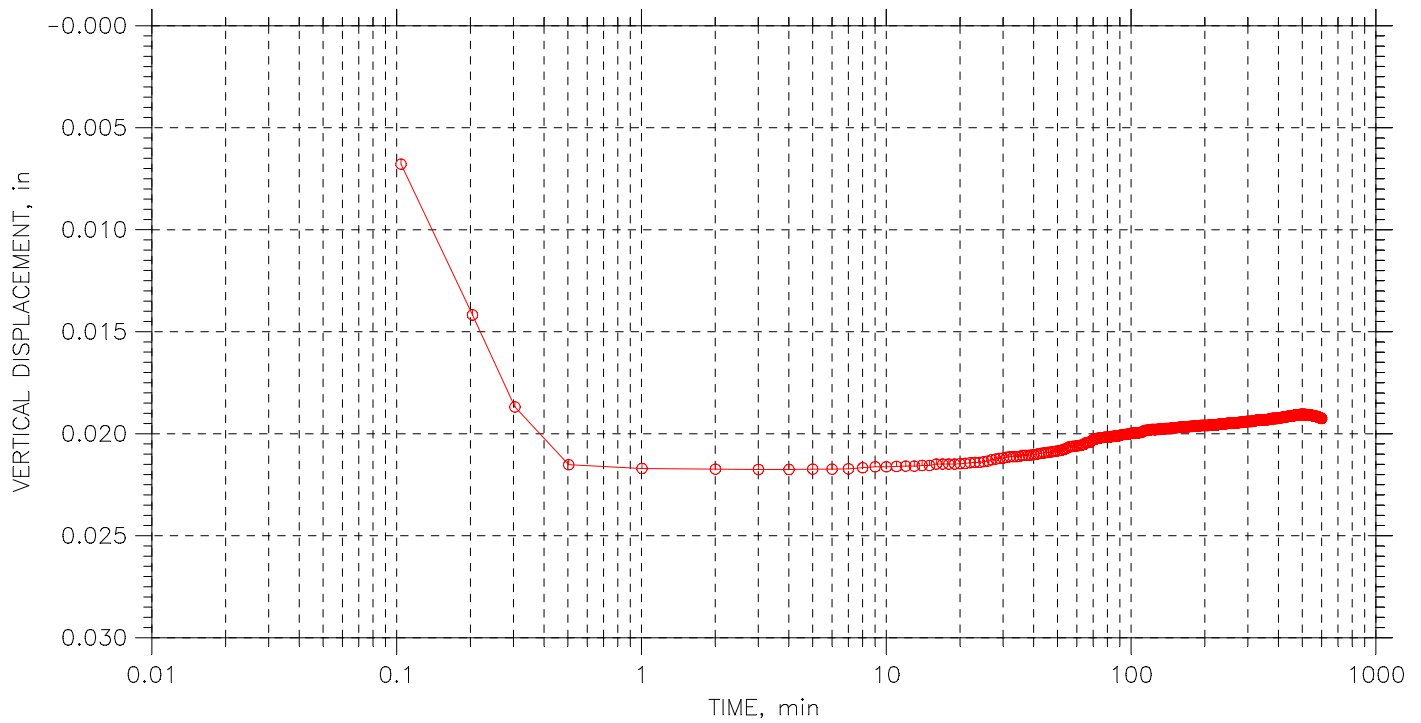
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-3	
Sample Type: Pitcher	
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)	
Remarks: Constant Load (Sample allowed to swell before shearing)	

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

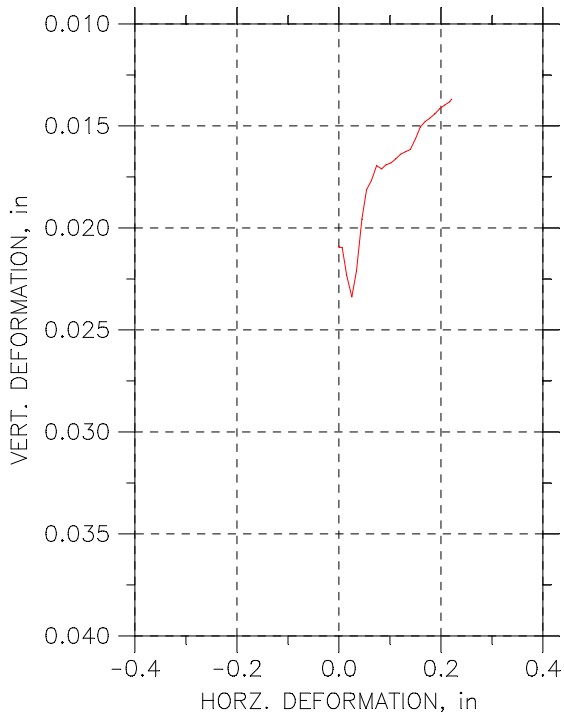
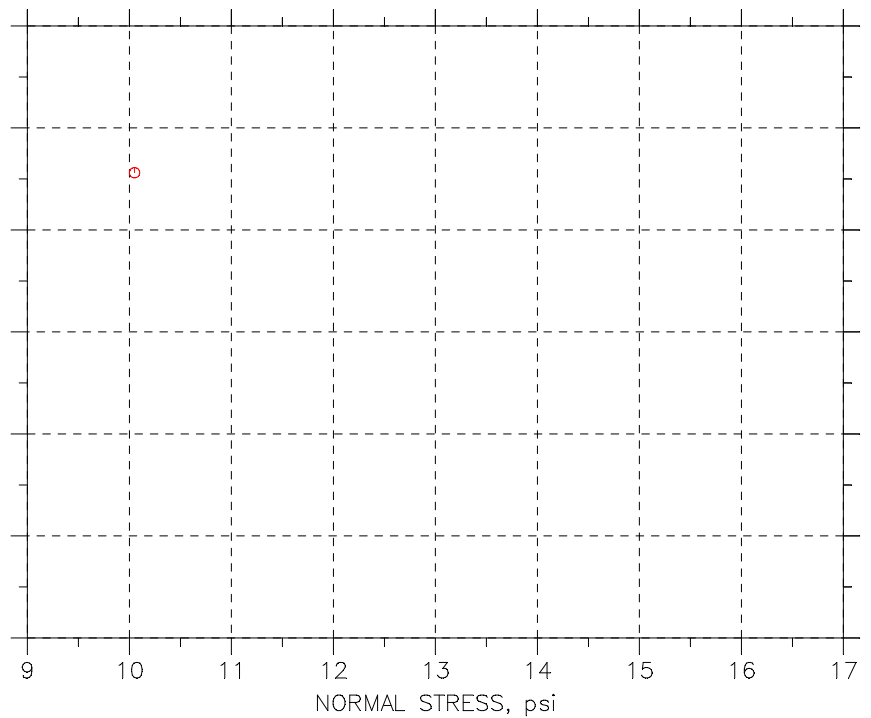
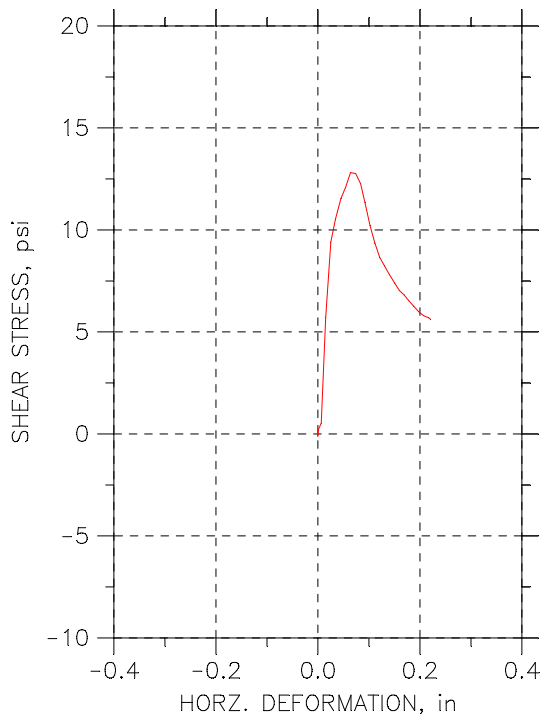
Step: 1 of 1

Stress: 10 psi



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-3	Tested By: gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.5'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

DIRECT SHEAR TEST REPORT

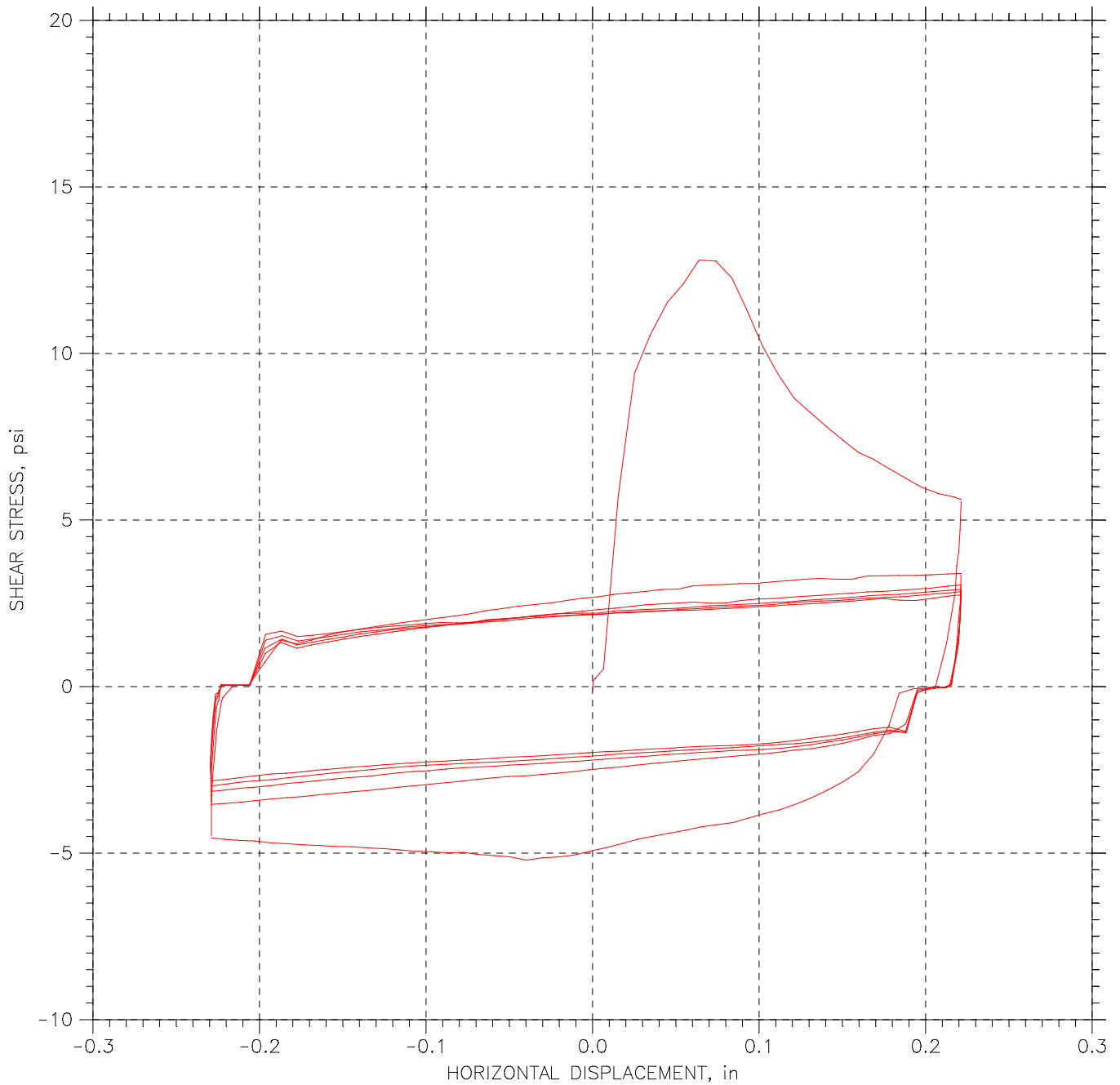


Symbol				
Test No.	B-1			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	33.02		
	Dry Density, pcf	94.73		
	Saturation, %	114.41		
	Void Ratio	0.77926		
Consol. Height, in		0.98075		
Consol. Void Ratio		0.74501		
Final	Water Content, %	31.90		
	Dry Density, pcf	98.28		
	Saturation, %	120.46		
	Void Ratio	0.71504		
Normal Stress, psi		10.05		
Max. Shear Stress, psi		12.802		
Ult. Shear Stress, psi		5.6145		
Time to Failure, min		7.0034		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		63		
Plastic Limit		27		
Plasticity Index		36		
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)				
Remarks: Constant Load (Sample allowed to swell before shearing)				

Project: Purple Line
Location: College Park, MD
Project No.: 14961
Boring No.: CP-3
Sample Type: Pitcher

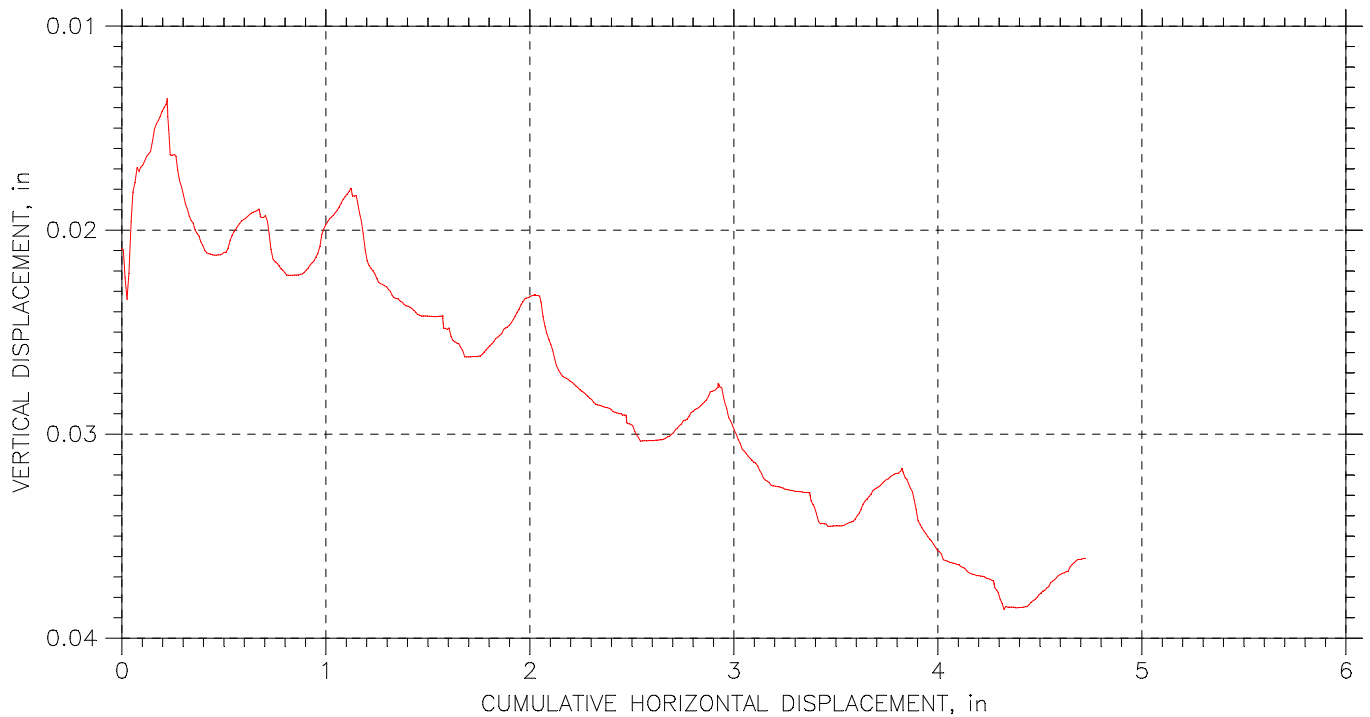
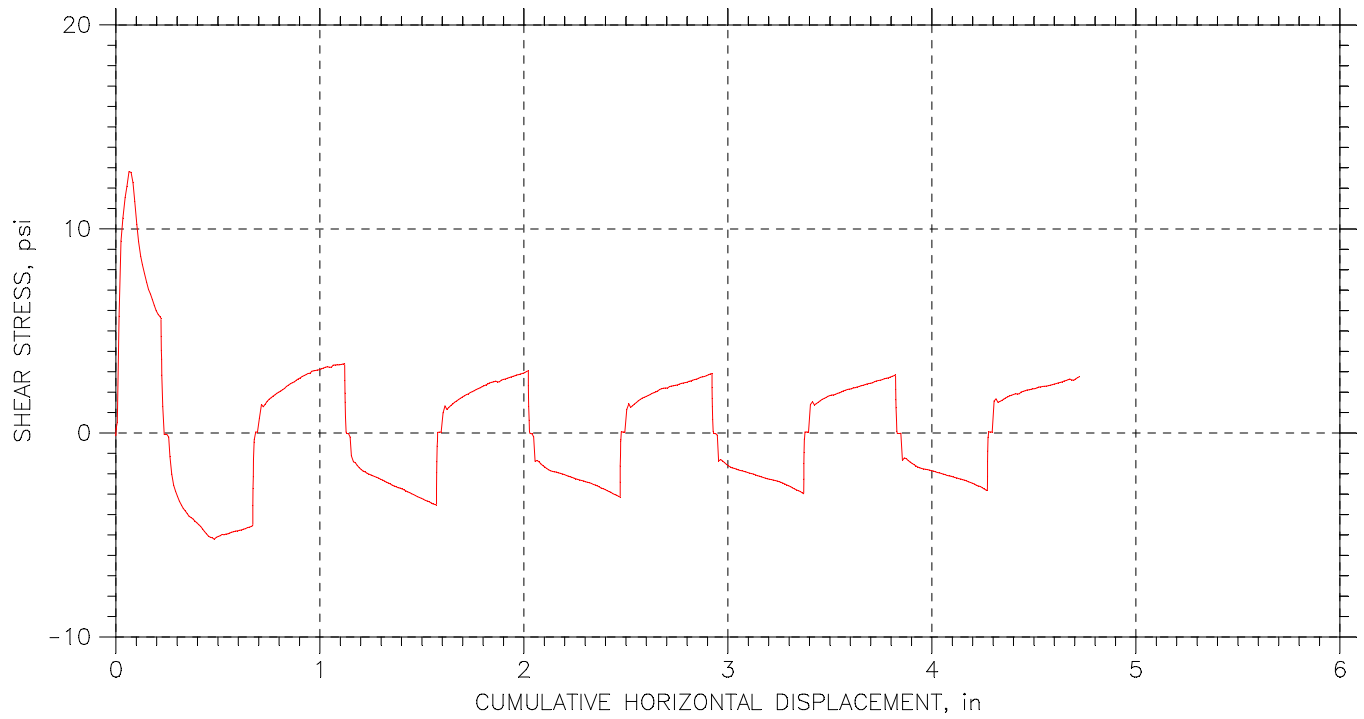
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)
Remarks: Constant Load (Sample allowed to swell before shearing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-3	Tested By: gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.5'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

RESIDUAL SHEAR TEST



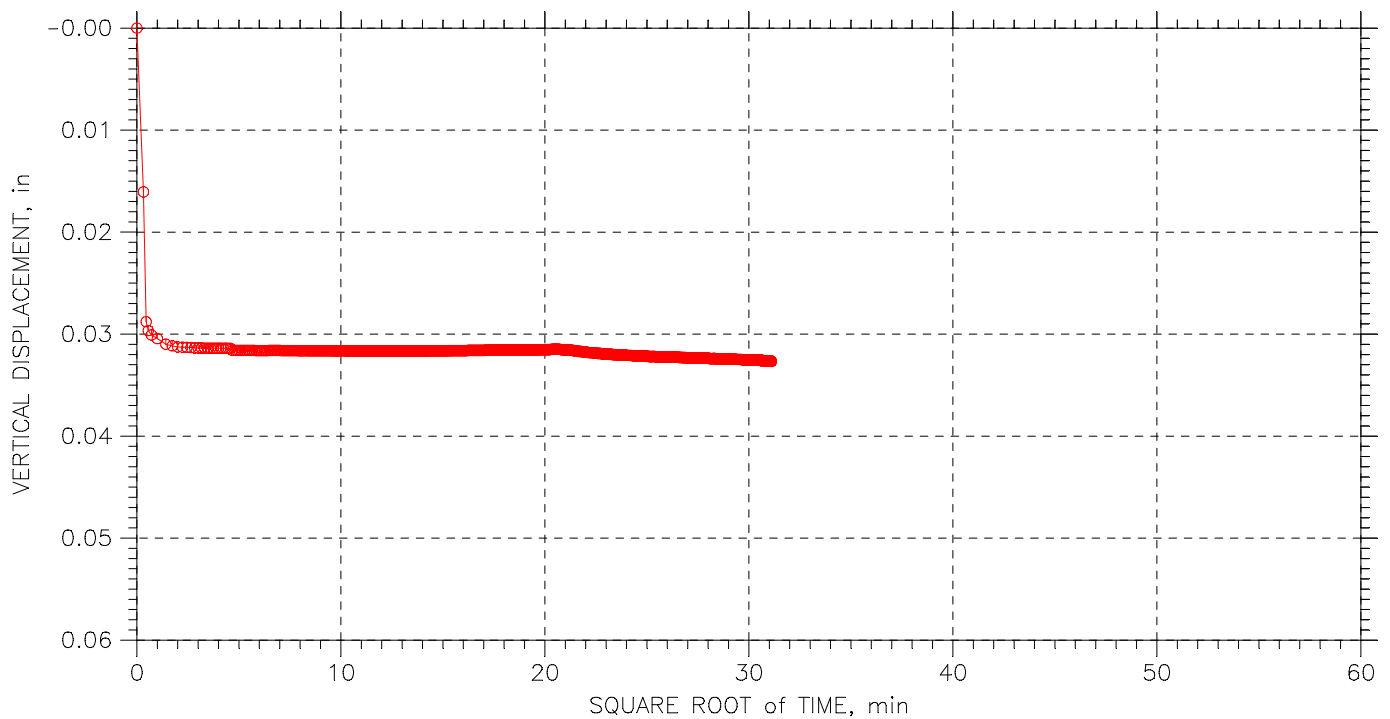
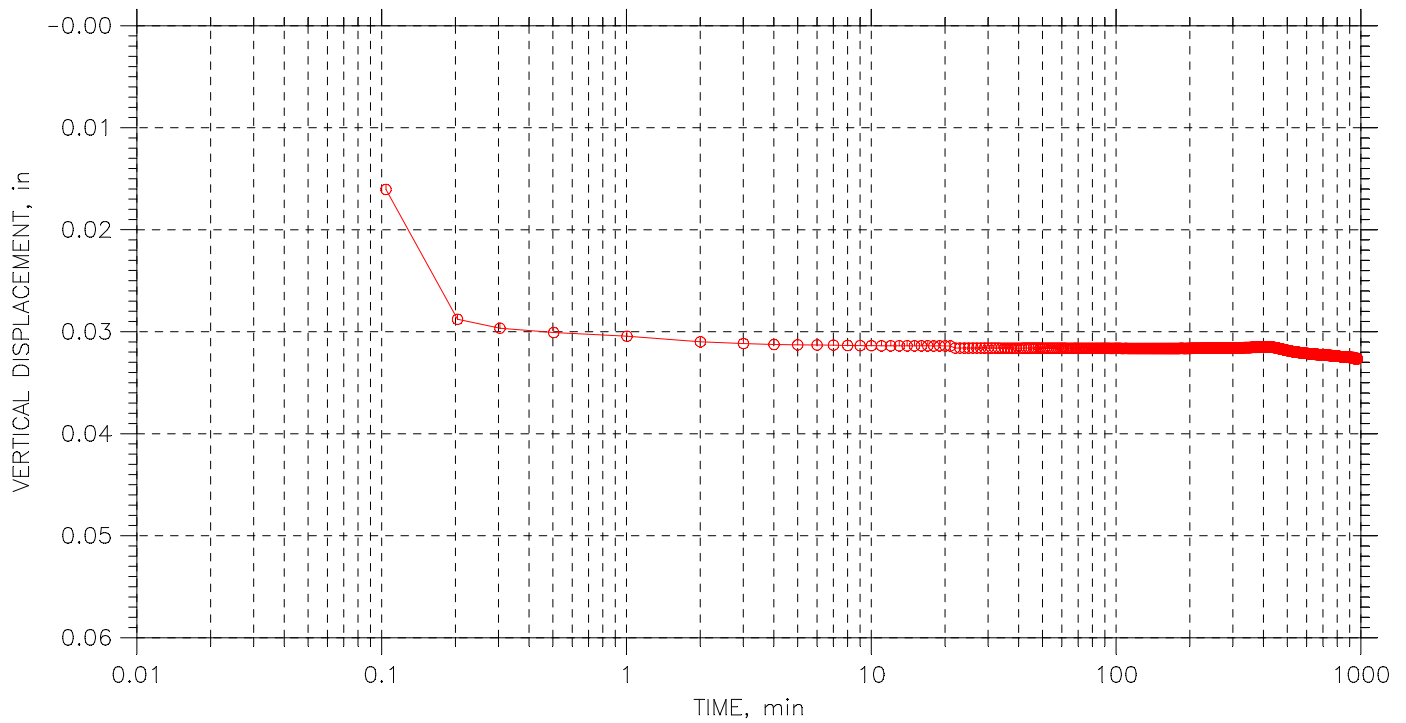
Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-3	Tested By: gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.5'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

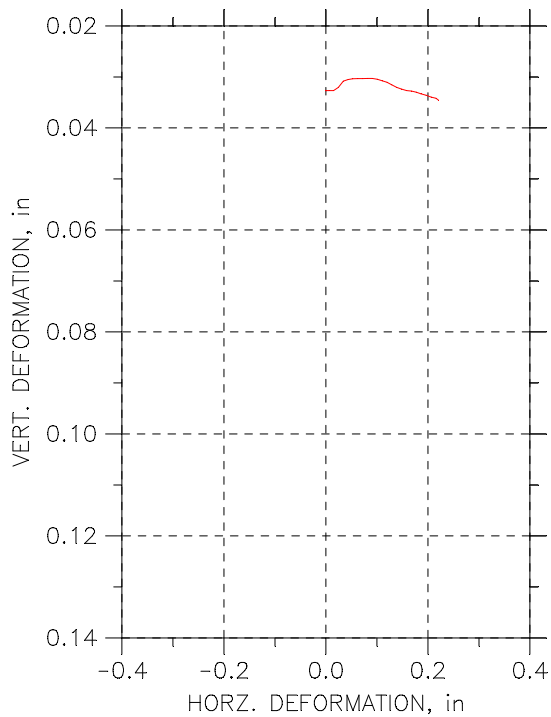
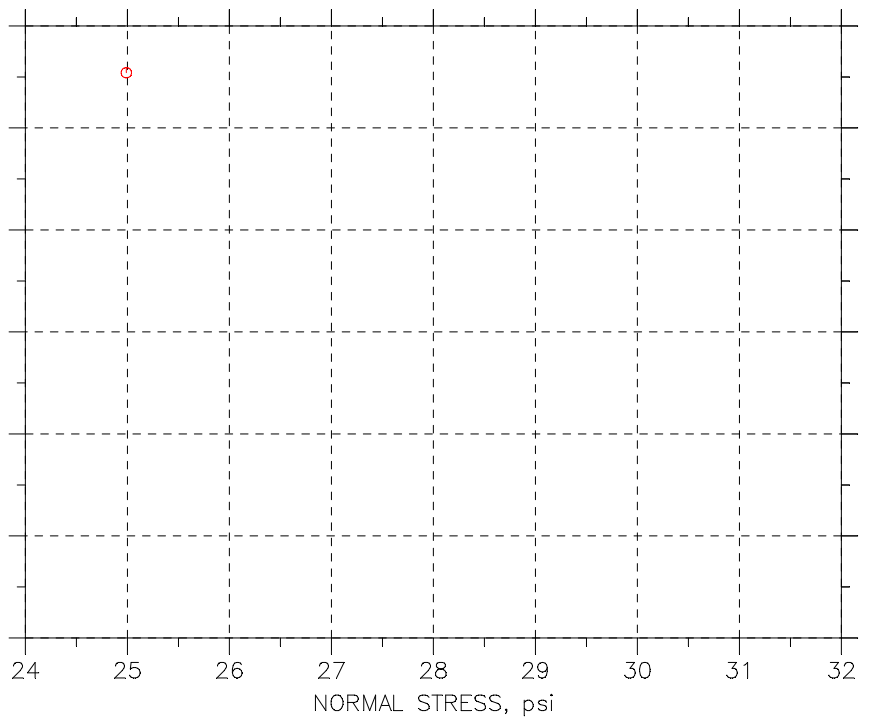
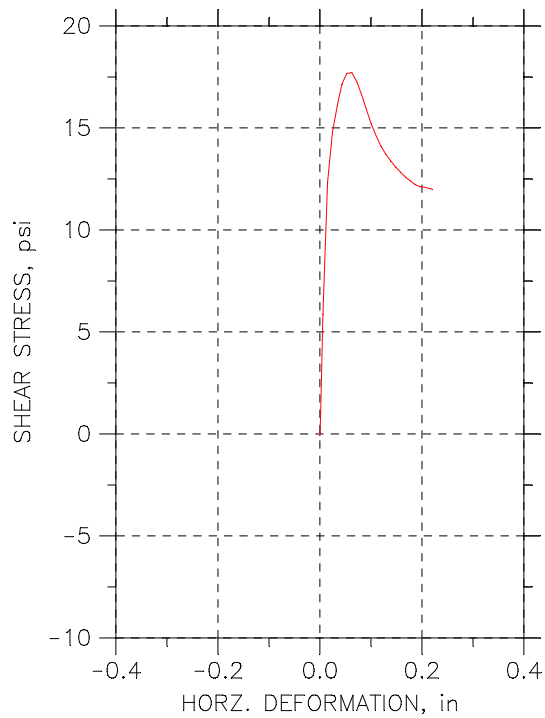
Step: 1 of 1

Stress: 25 psi



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.6'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

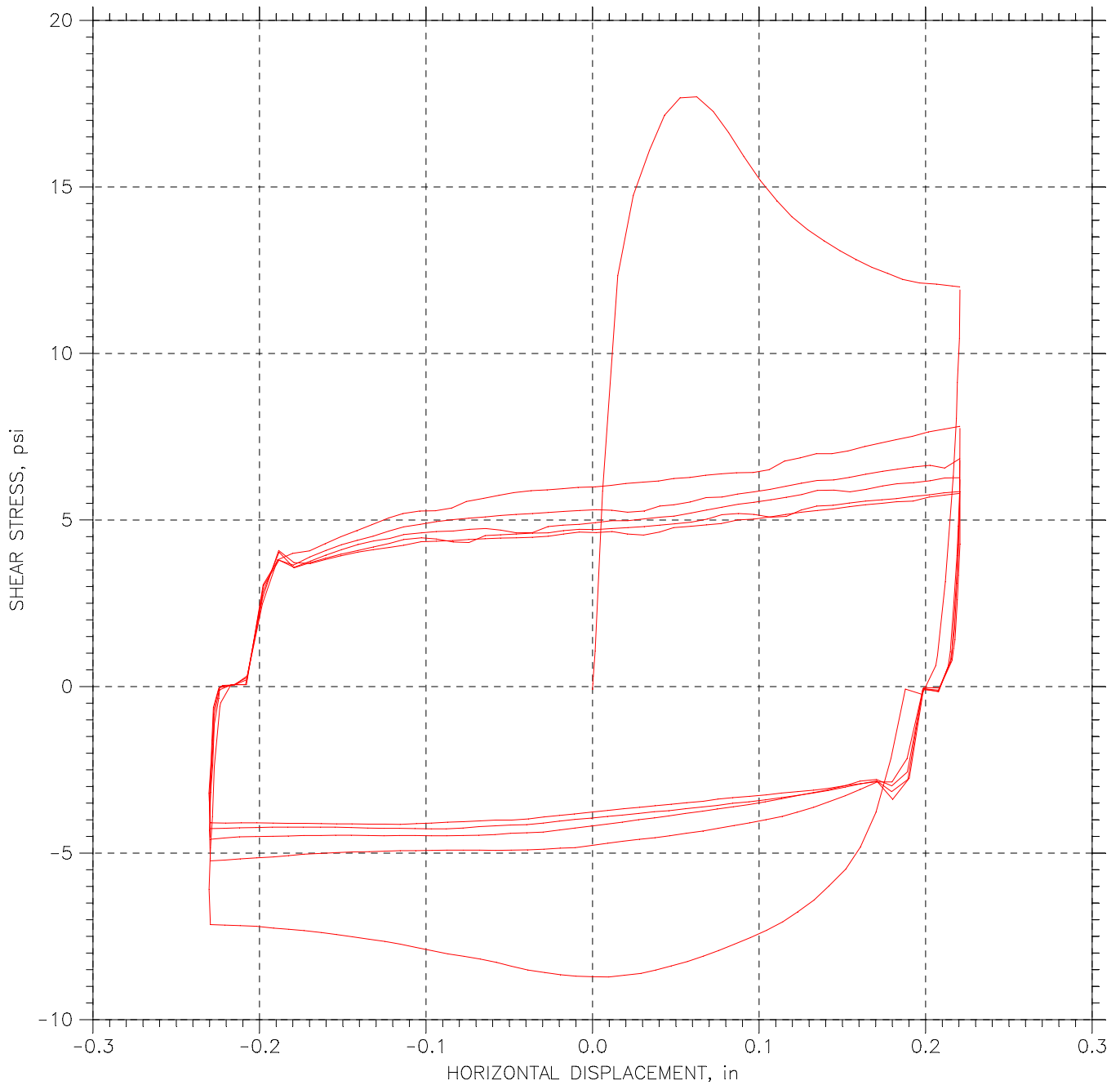
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-2			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	38.85		
	Dry Density, pcf	90.94		
	Saturation, %	122.92		
	Void Ratio	0.85342		
Consol. Height, in		0.96733		
Consol. Void Ratio		0.79287		
Final	Water Content, %	30.16		
	Dry Density, pcf	102.5		
	Saturation, %	126.31		
	Void Ratio	0.6448		
Normal Stress, psi		24.989		
Max. Shear Stress, psi		17.705		
Ult. Shear Stress, psi		11.999		
Time to Failure, min		7.0034		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		63		
Plastic Limit		27		
Plasticity Index		36		

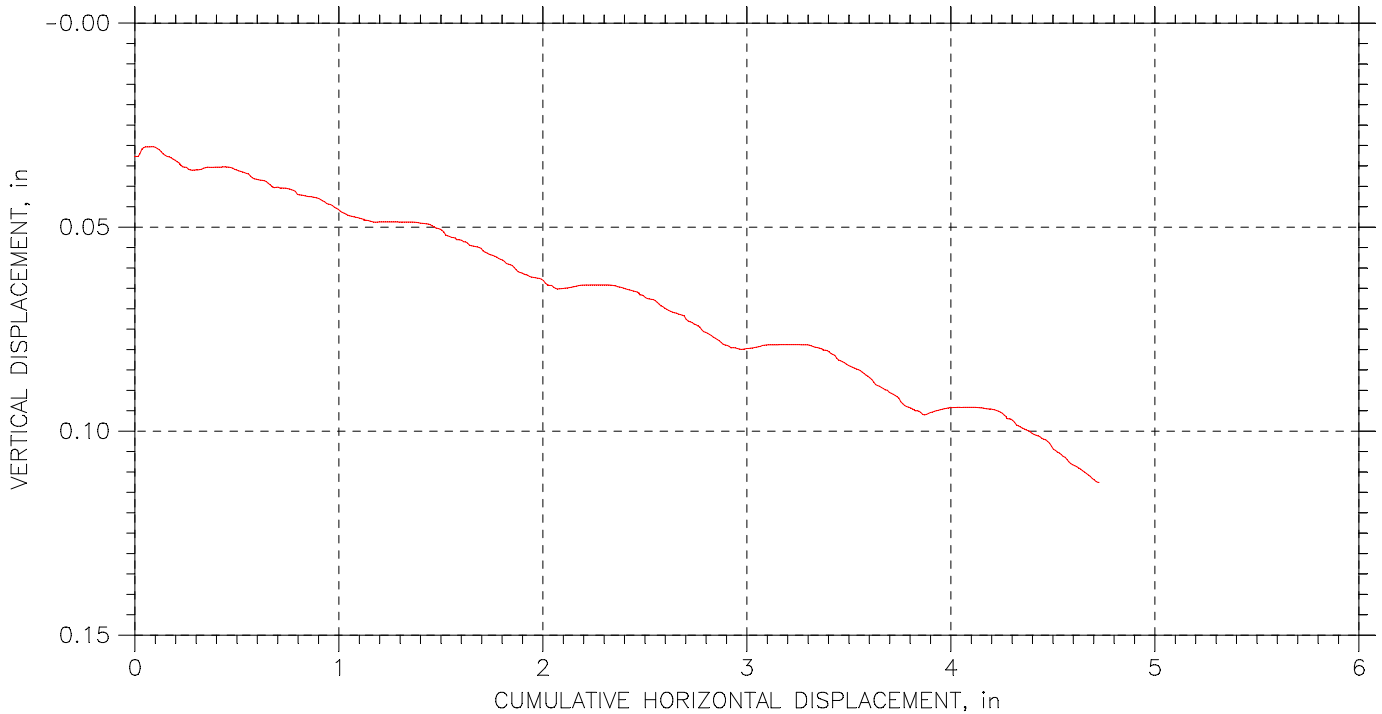
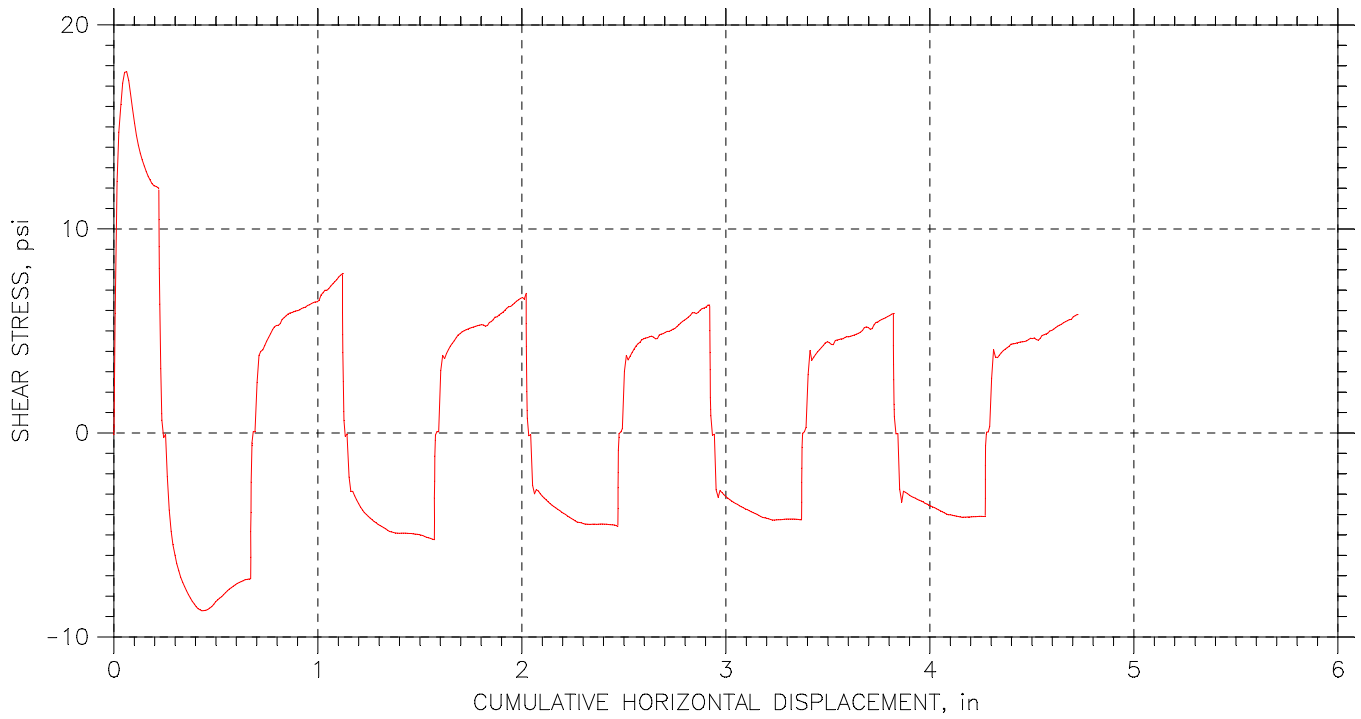
Project: Purple Line	
Location: College Park	
Project No.: 14961	
Boring No.: CP-3	
Sample Type: Pitcher	
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)	
Remarks: Constant Load (Sample allowed to swell before shearing)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.6'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

RESIDUAL SHEAR TEST



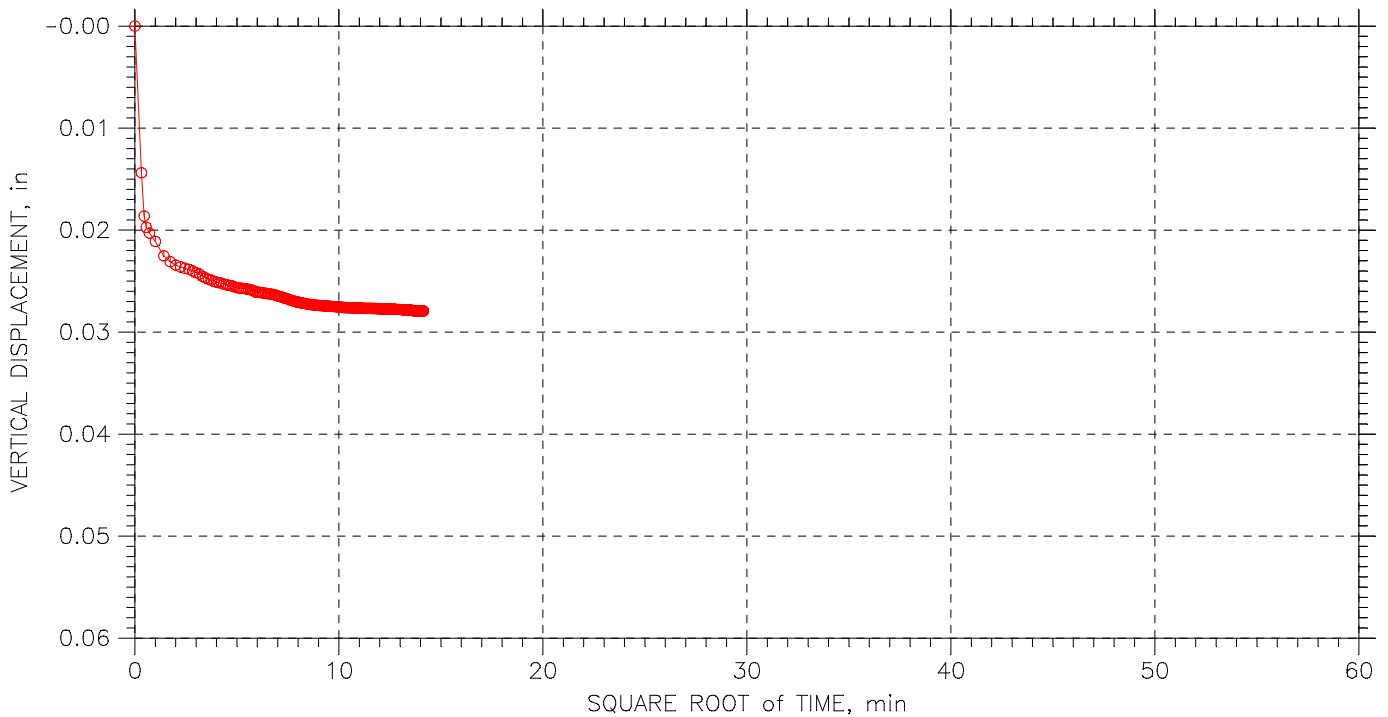
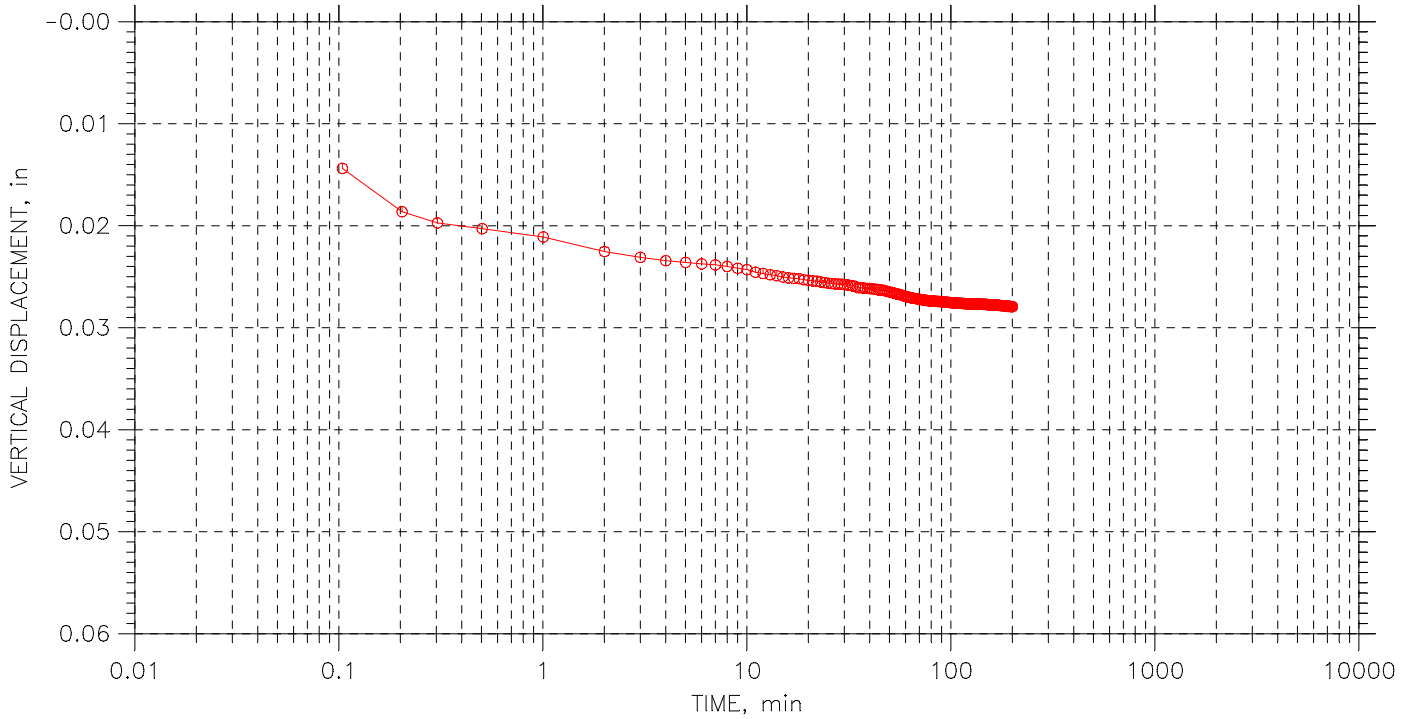
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.6'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 2

Stress: 25 psi



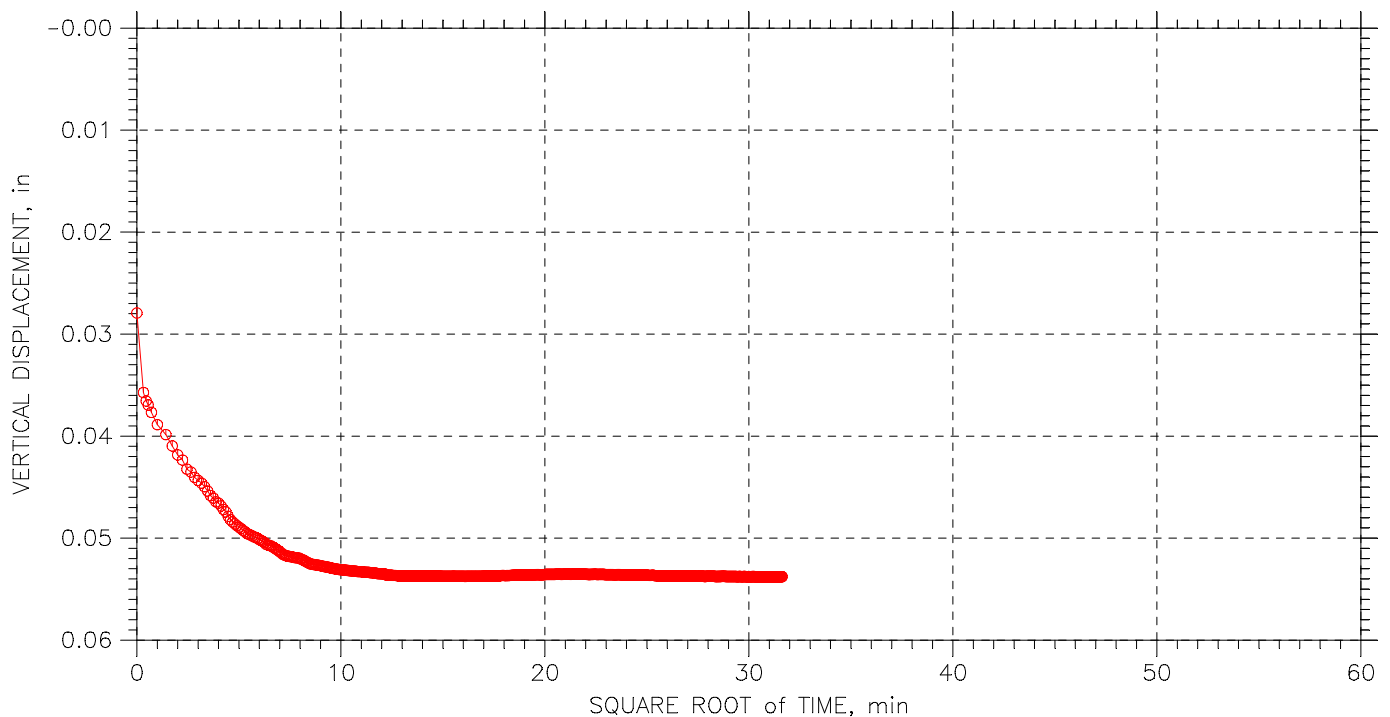
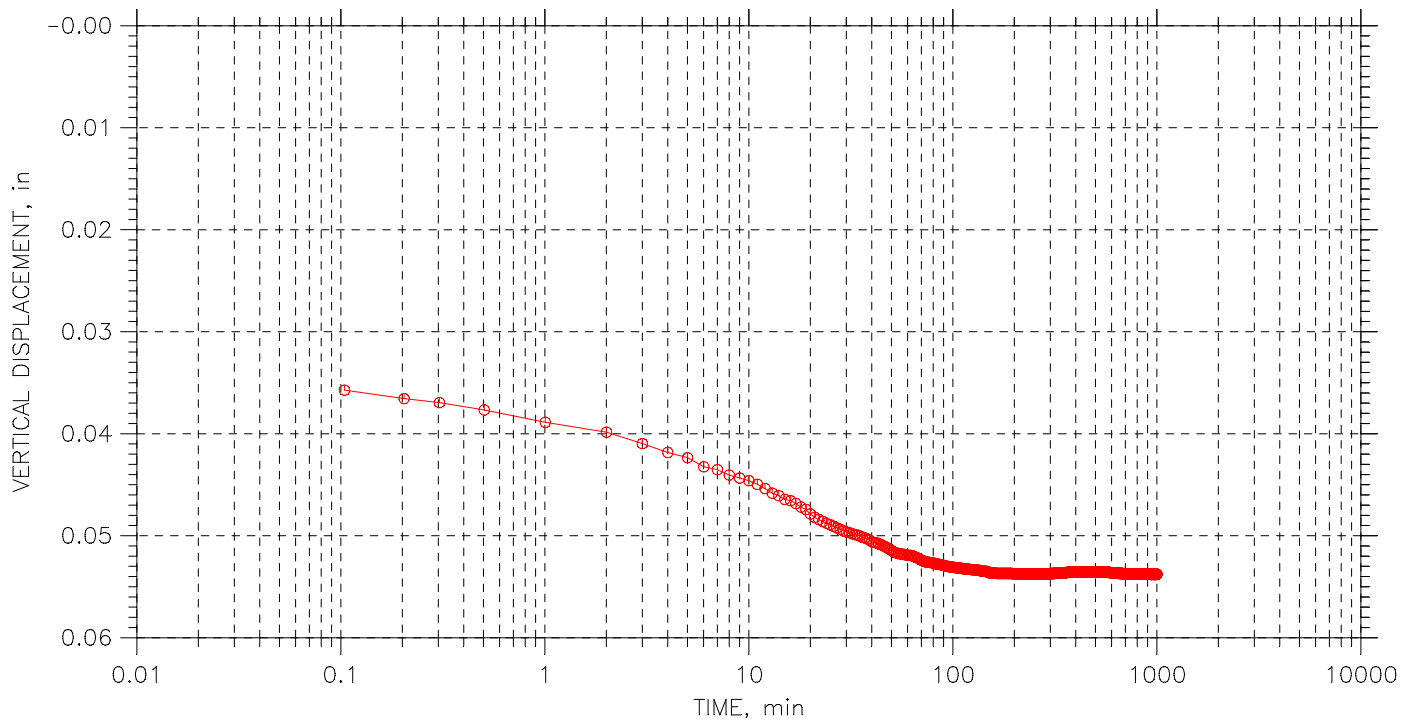
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.7'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

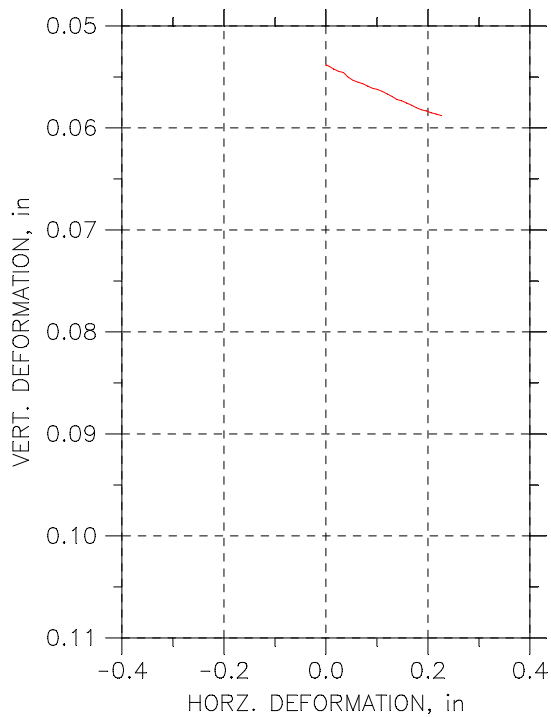
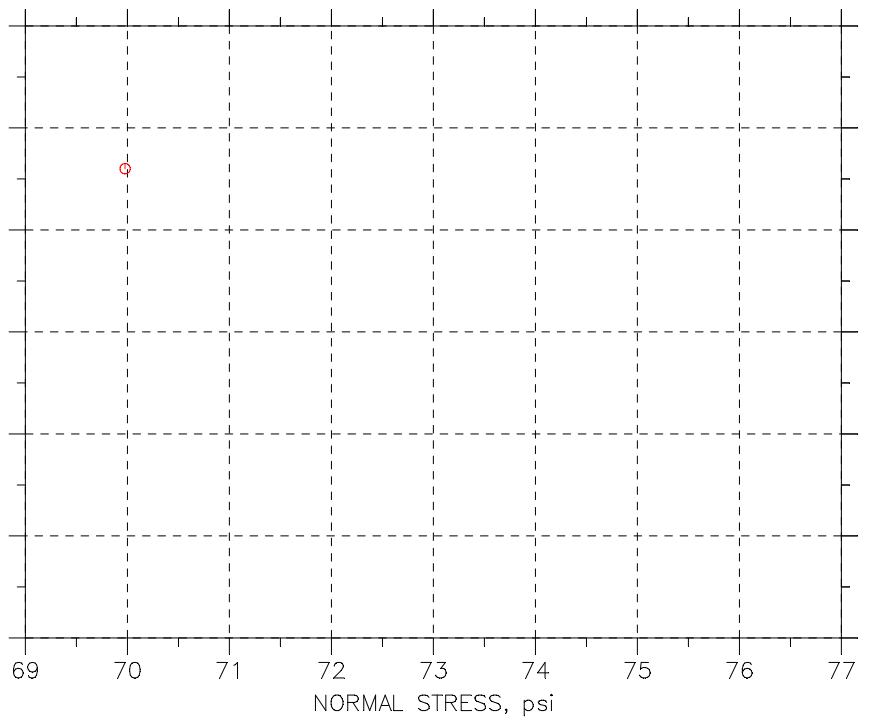
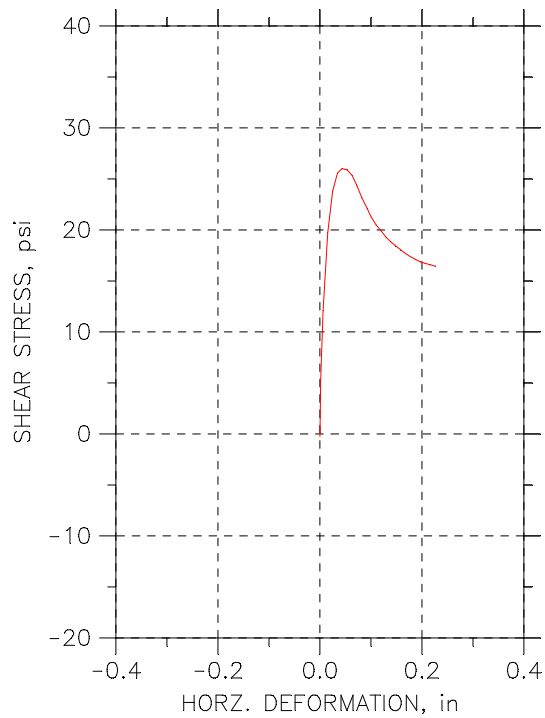
Step: 2 of 2

Stress: 70 psi



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.7'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

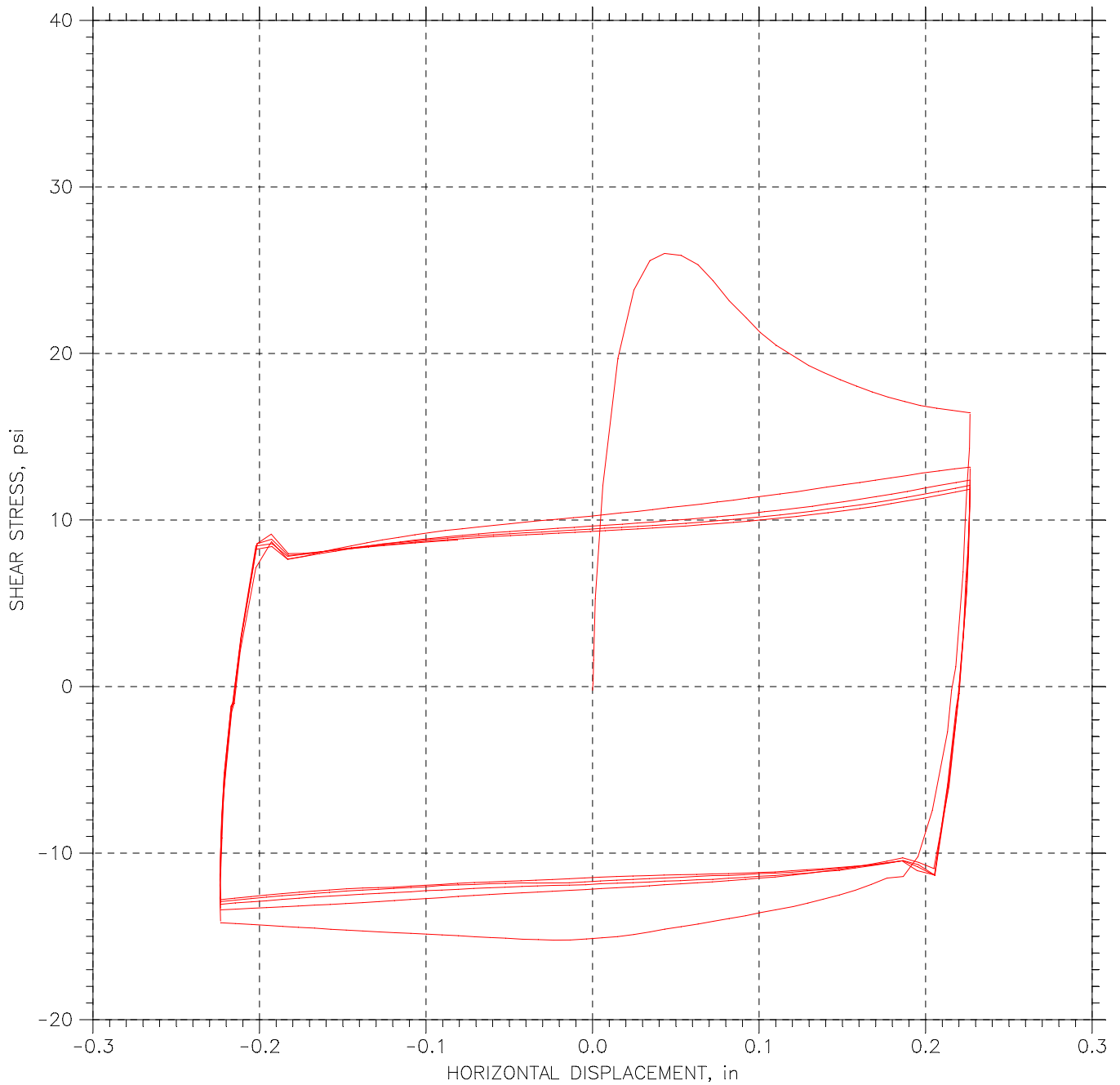
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-3			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	29.95		
	Dry Density, pcf	97.11		
	Saturation, %	109.92		
	Void Ratio	0.73578		
Consol. Height, in		0.94622		
Consol. Void Ratio		0.64243		
Final	Water Content, %	27.08		
	Dry Density, pcf	106.1		
	Saturation, %	124.18		
	Void Ratio	0.58878		
Normal Stress, psi		69.977		
Max. Shear Stress, psi		26.002		
Ult. Shear Stress, psi		16.446		
Time to Failure, min		5.0036		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		63		
Plastic Limit		27		
Plasticity Index		36		

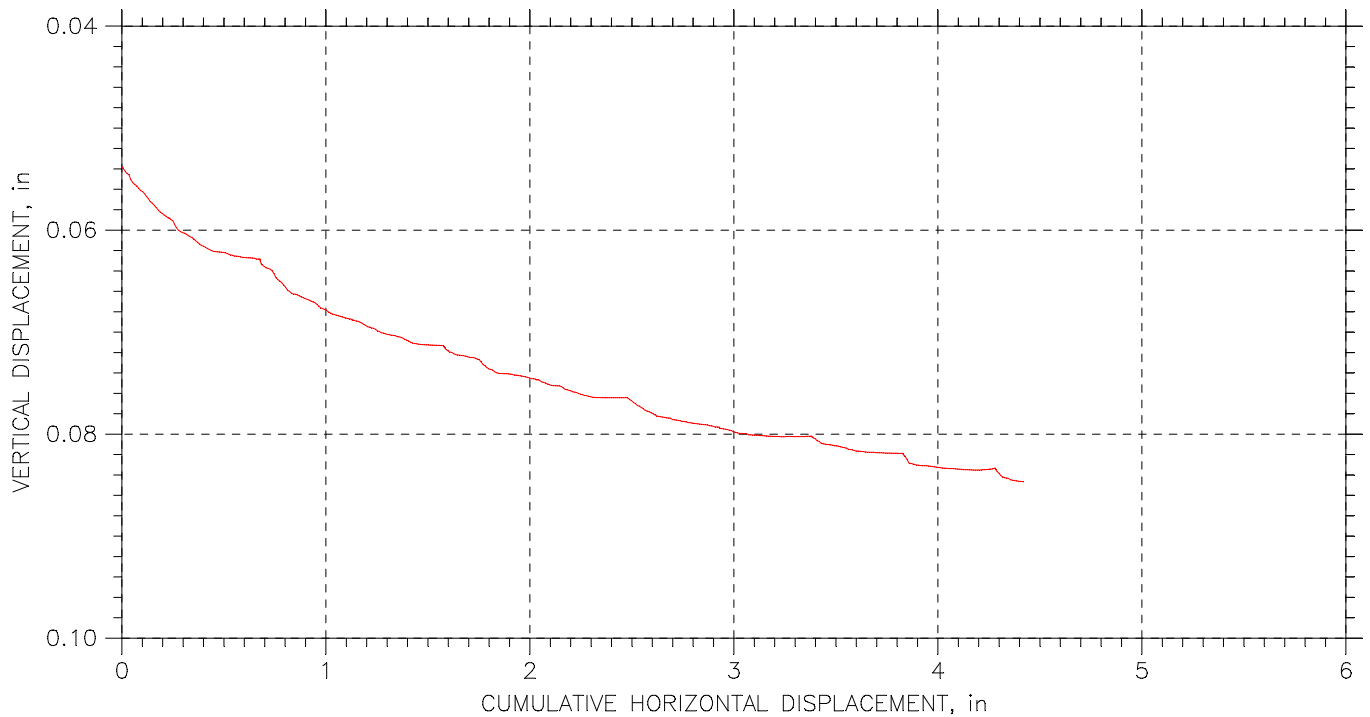
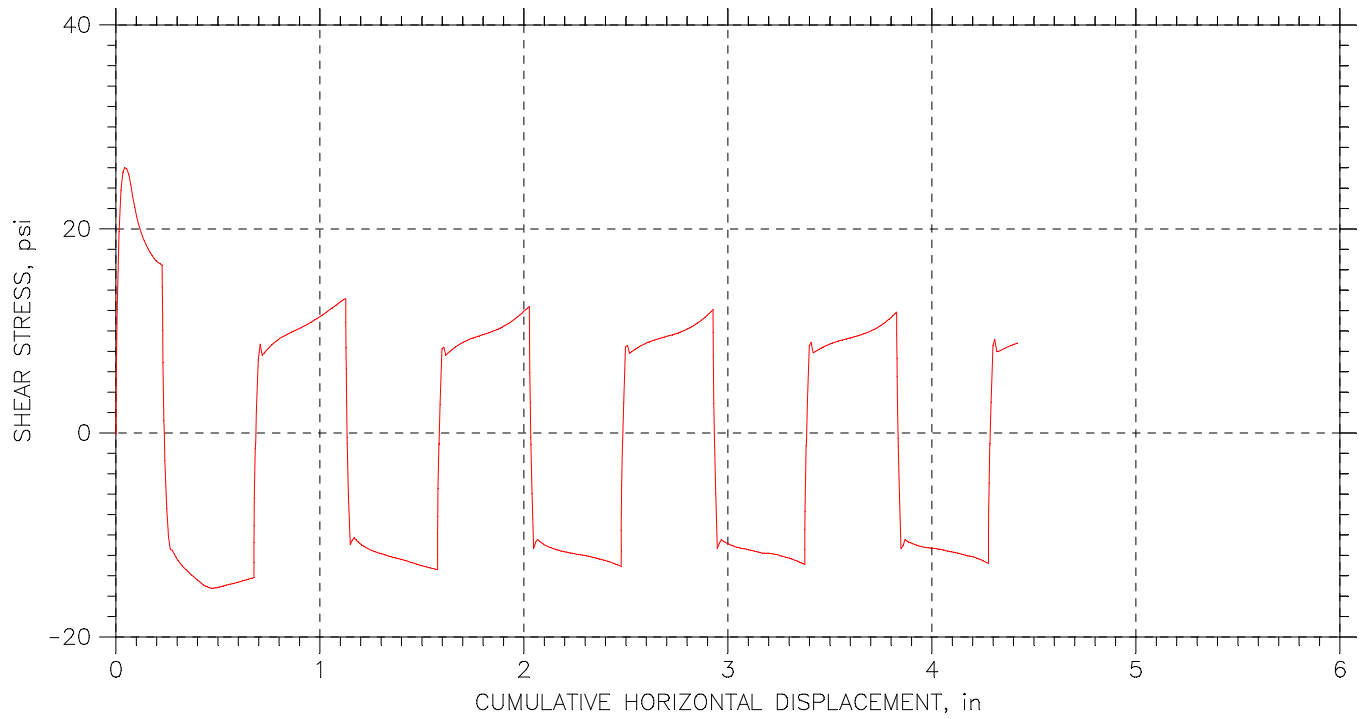
Project: Purple Line	
Location: College Park	
Project No.: 14961	
Boring No.: CP-3	
Sample Type: Pitcher	
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)	
Remarks: Constant Load (Sample allowed to swell before shearing)	

RESIDUAL SHEAR TEST



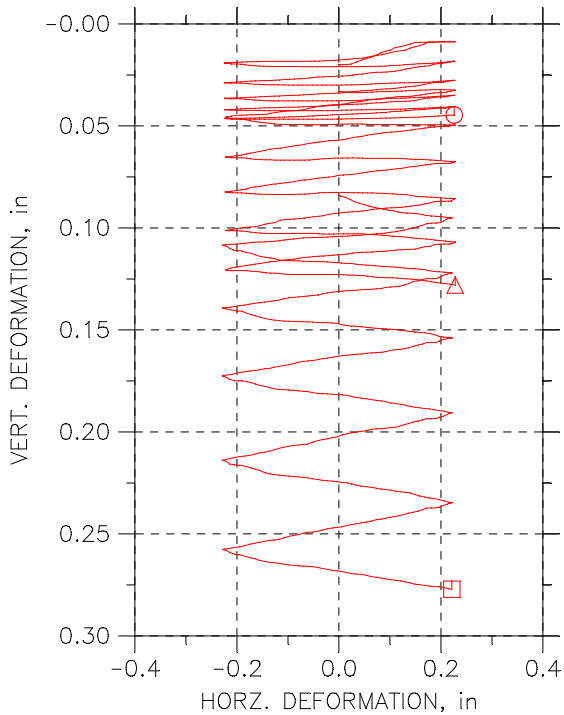
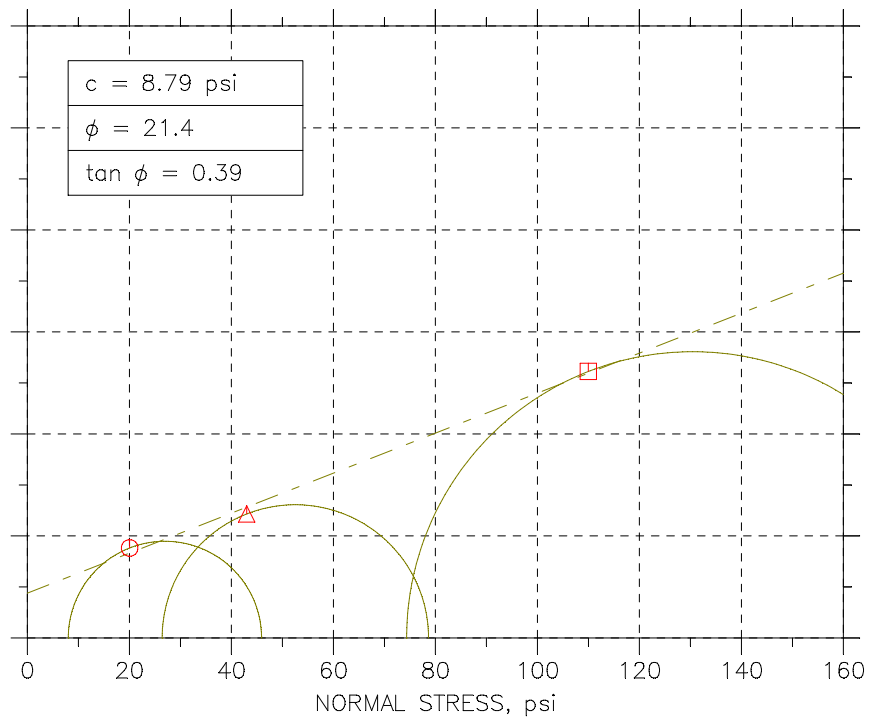
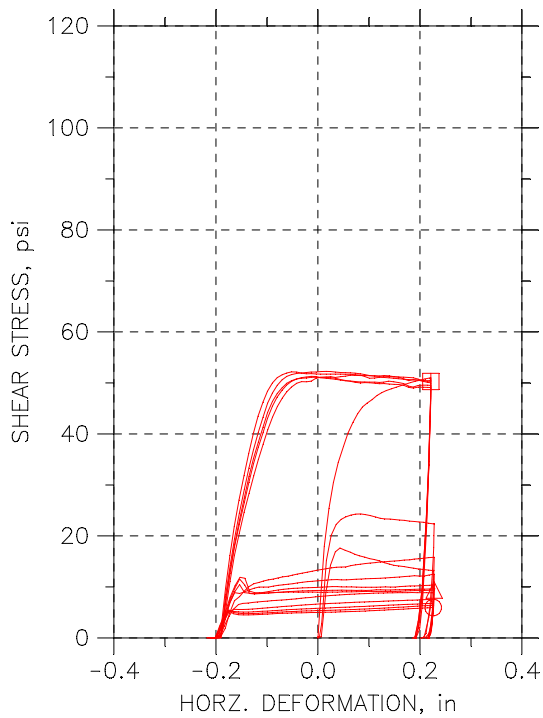
Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.7'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park	Project No.: 14961
Boring No.: CP-3	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/23/07	Depth: 28.7'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled Red, Dark Brown and Gray Medium Stiff to Very Stiff CLAY with trace fine Sand. (CH)		
Remarks: Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST REPORT



Symbol	⊖	△	□	
Test No.	A-1	A-2	A-3	
Sample No.	P-3	P-3	P-3	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	25.59	23.64	20.38
	Dry Density, pcf	103.05	105.12	114.11
	Saturation, %	108.69	105.76	115.33
	Void Ratio	0.63563	0.6034	0.47713
Consol. Height, in		0.97937	0.96671	0.91599
Consol. Void Ratio		0.60188	0.55001	0.35304
Final	Water Content, %	23.22	24.66	17.40
	Dry Density, pcf	107.87	120.56	157.85
	Saturation, %	111.45	167.23	692.95
	Void Ratio	0.56256	0.39807	0.067805
Normal Stress, psi		20.049	43.002	109.99
Max. Shear Stress, psi		17.638	24.313	52.245
Shear Stress, psi		5.9623	9.3823	50.29
Time to Failure, min		5.0037	9.0034	399.01
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		53	53	53
Plastic Limit		24	24	24
Plasticity Index		29	29	29

Project: Purple Line

Location: College Park, MD

Project No.: 14961

Boring No.: CP-3A

Sample Type: Pitcher

Description: Visual :Dark Gray Medium Stiff CLAY with Silt and fine sand Lenses (CH)

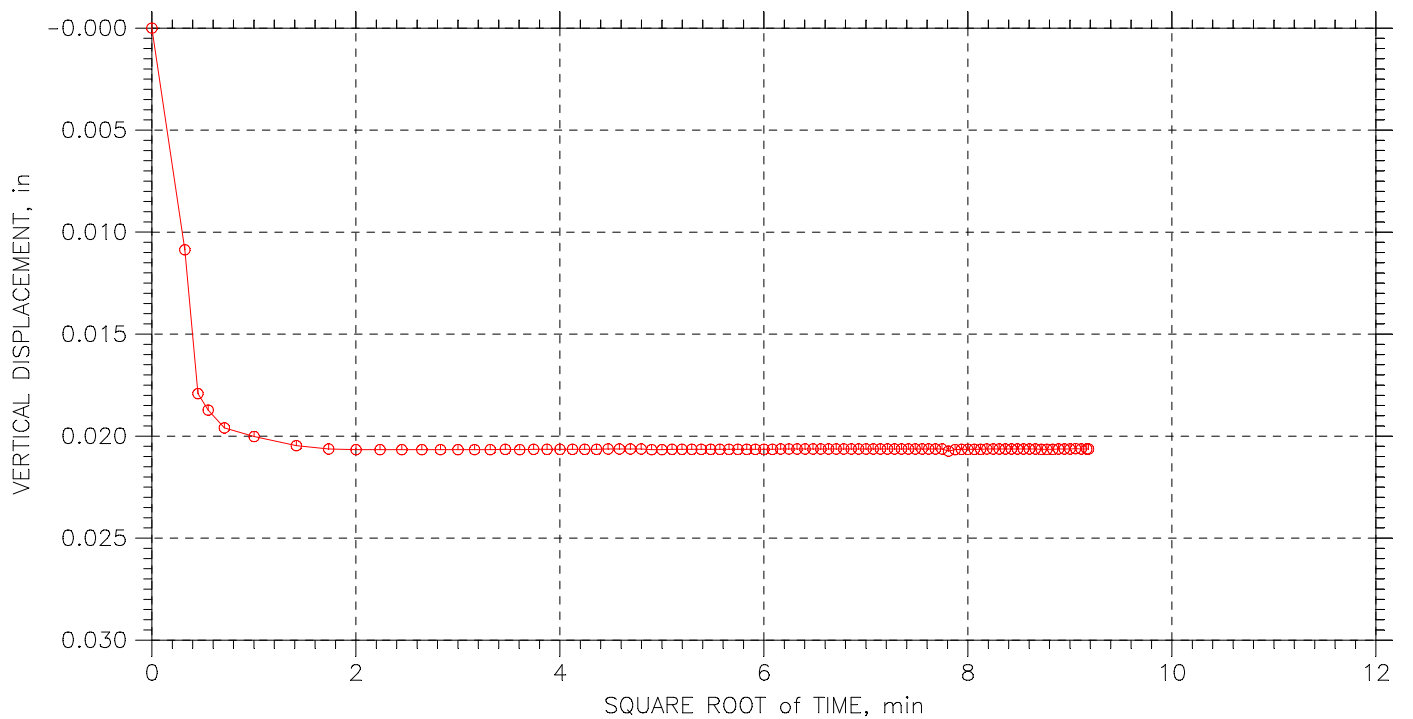
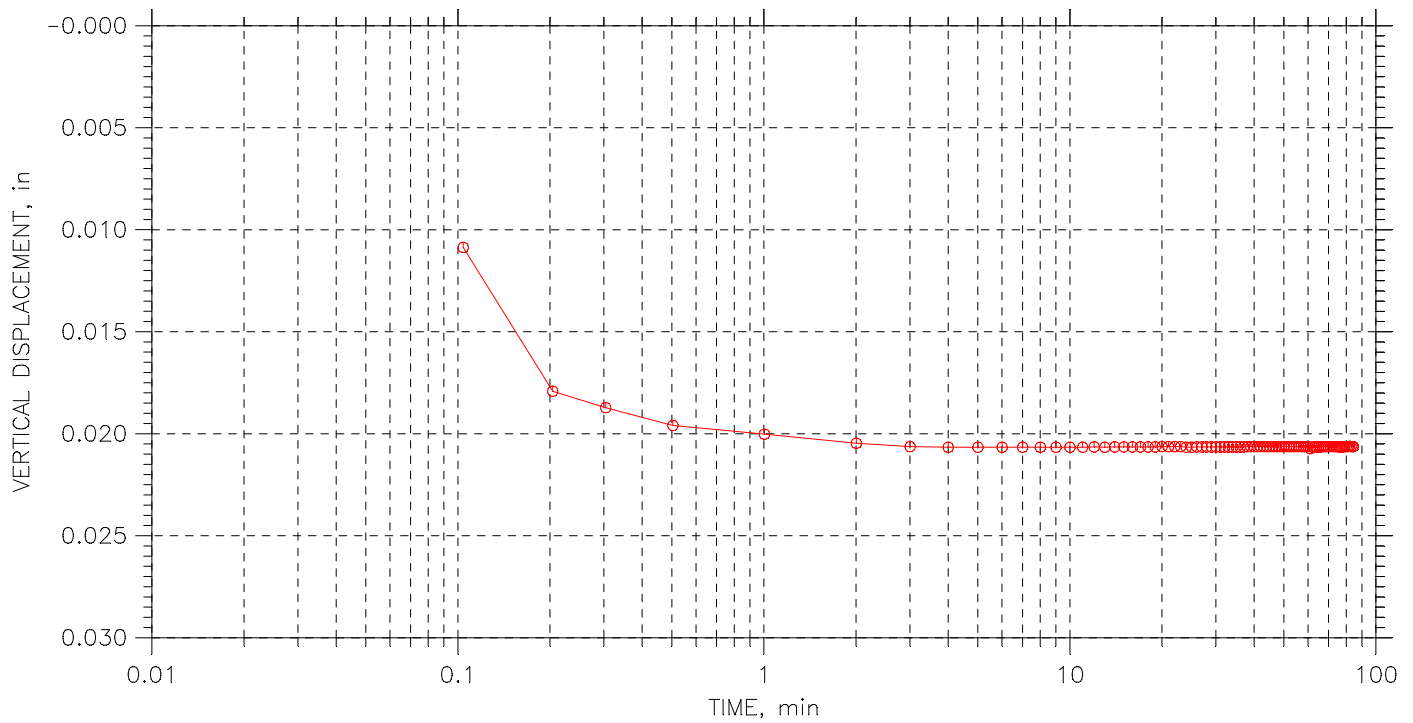
Remarks: Constant Volume (Sample Not Allowed to Swell)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

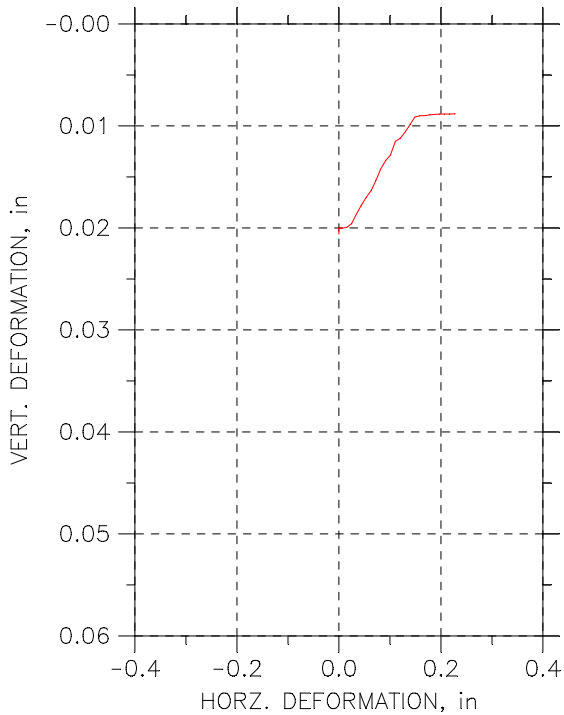
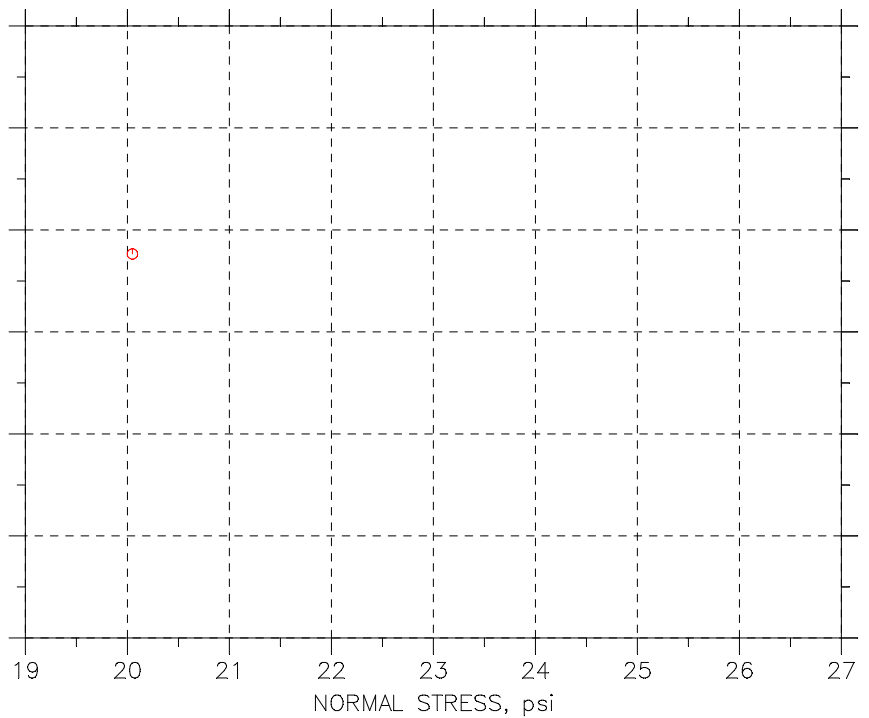
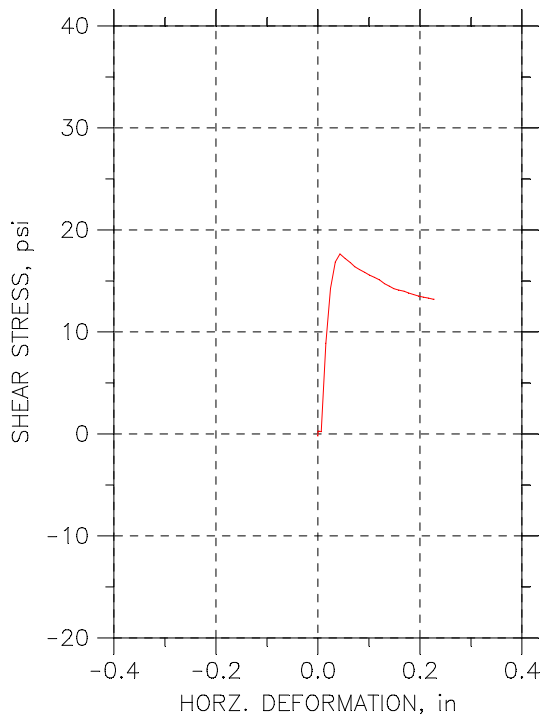
Step: 1 of 1

Stress: 20 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.5
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Visual :Dark Gray Medium Stiff CLAY with Silt and fine sand Lenses (CH)		
Remarks: Constant Volume (Sample Not Allowed to Swell)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007 Residu		

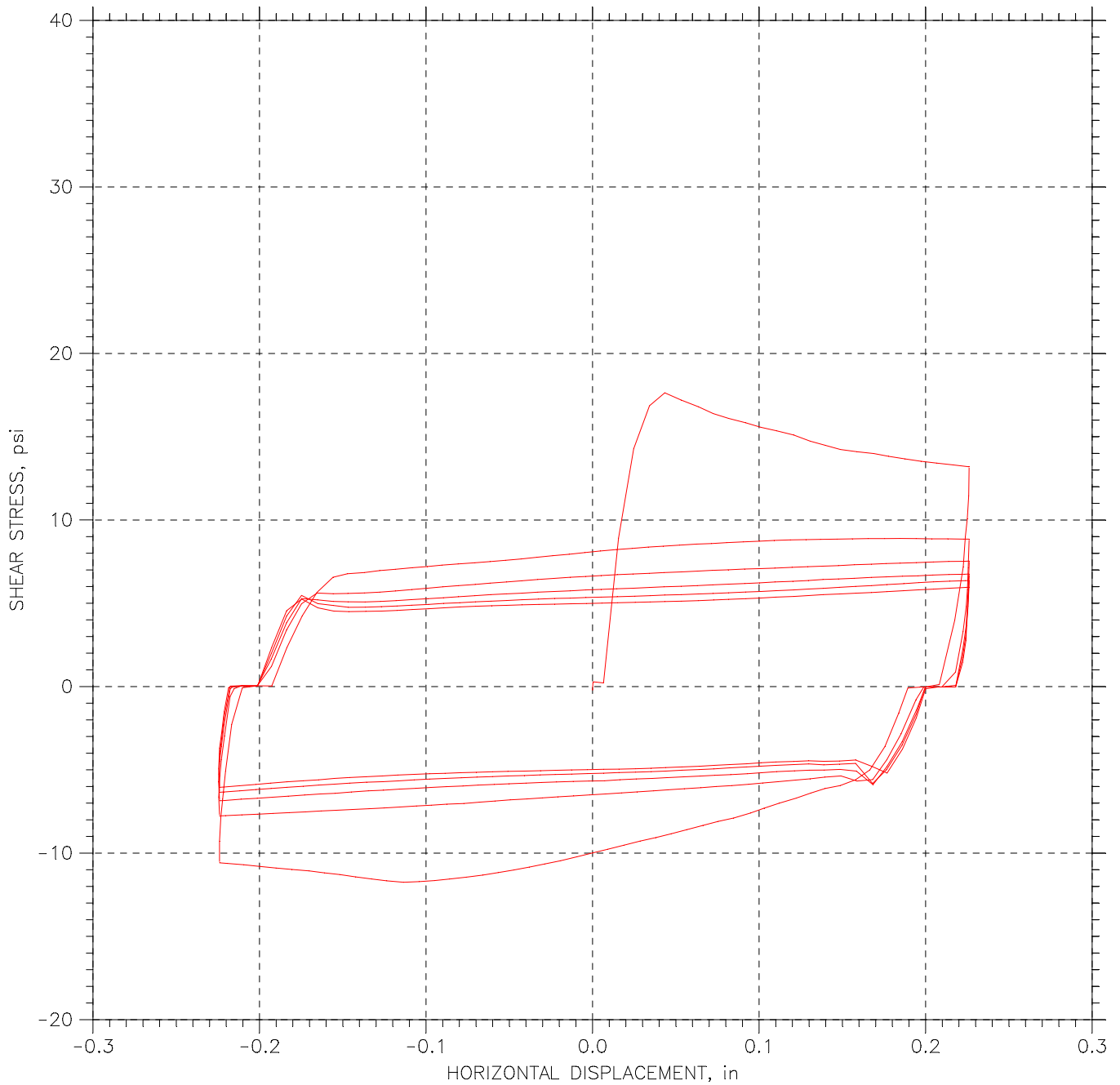
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-1			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	25.59		
	Dry Density, pcf	103.1		
	Saturation, %	108.69		
	Void Ratio	0.63563		
Consol. Height, in		0.97937		
Consol. Void Ratio		0.60188		
Final	Water Content, %	23.22		
	Dry Density, pcf	107.9		
	Saturation, %	111.45		
	Void Ratio	0.56256		
Normal Stress, psi		20.049		
Max. Shear Stress, psi		17.638		
Ult. Shear Stress, psi		13.208		
Time to Failure, min		5.0037		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		53		
Plastic Limit		24		
Plasticity Index		29		
Description: Visual :Dark Gray Medium Stiff CLAY with Silt and fine sand Lenses (CH)				
Remarks: Constant Volume (Sample Not Allowed to Swell)				

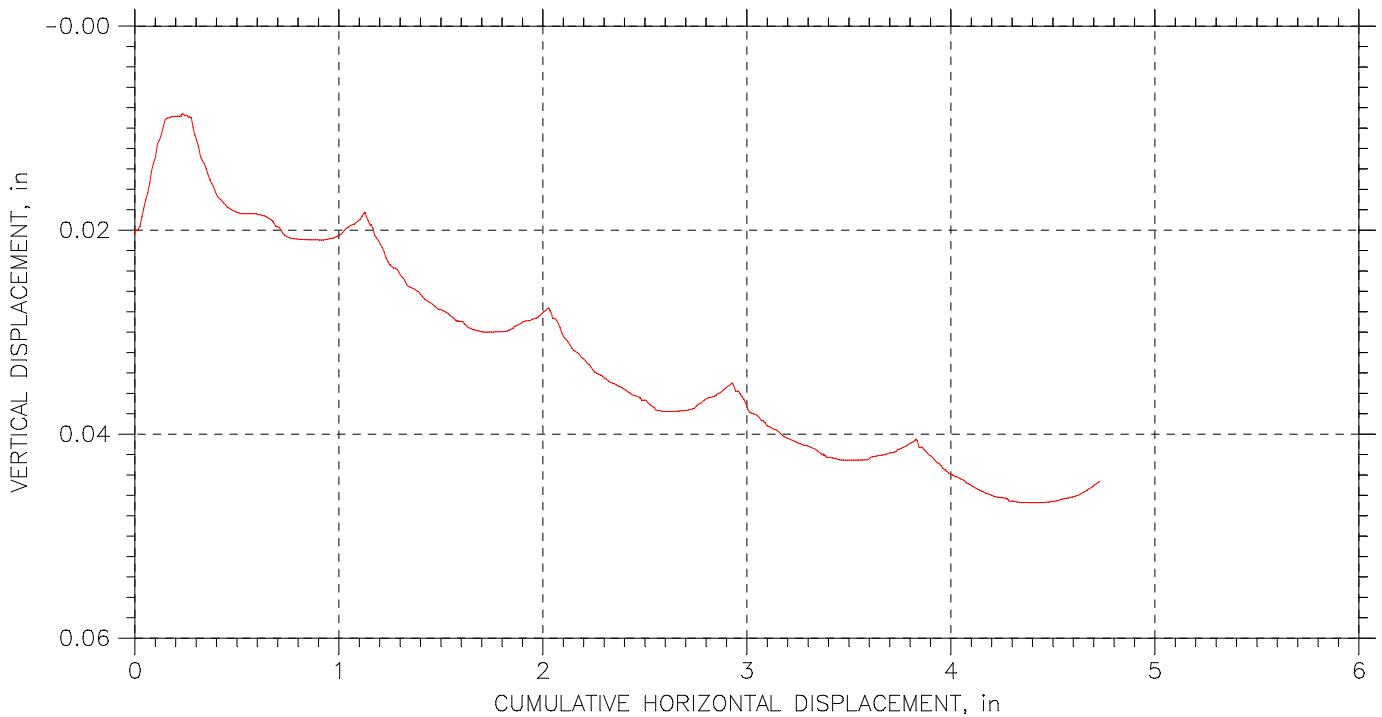
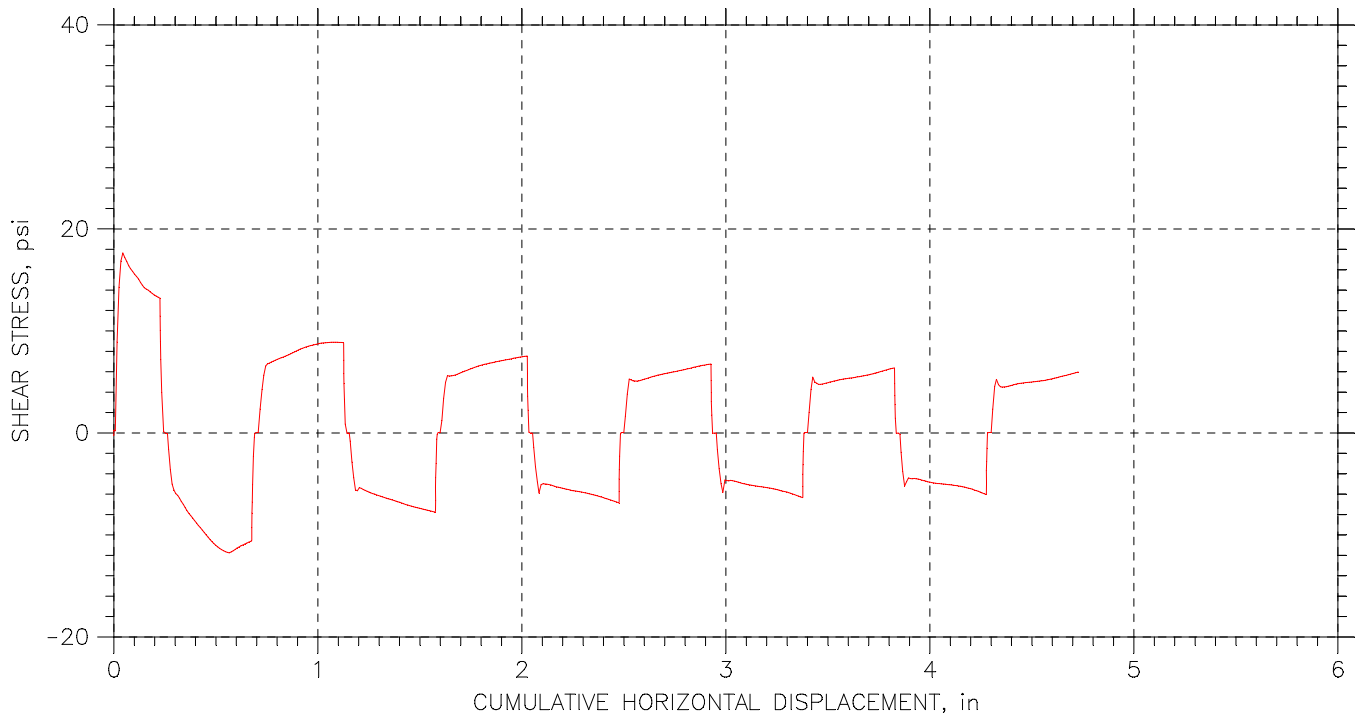
Project: Purple Line
Location: College Park,MD
Project No.: 14961
Boring No.: CP-3A
Sample Type: Pitcher
Description: Visual :Dark Gray Medium Stiff CLAY with Silt and fine sand Lenses (CH)
Remarks: Constant Volume (Sample Not Allowed to Swell)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.5
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Visual :Dark Gray Medium Stiff CLAY with Silt and fine sand Lenses (CH)		
Remarks: Constant Volume (Sample Not Allowed to Swell)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007 Residu		

RESIDUAL SHEAR TEST



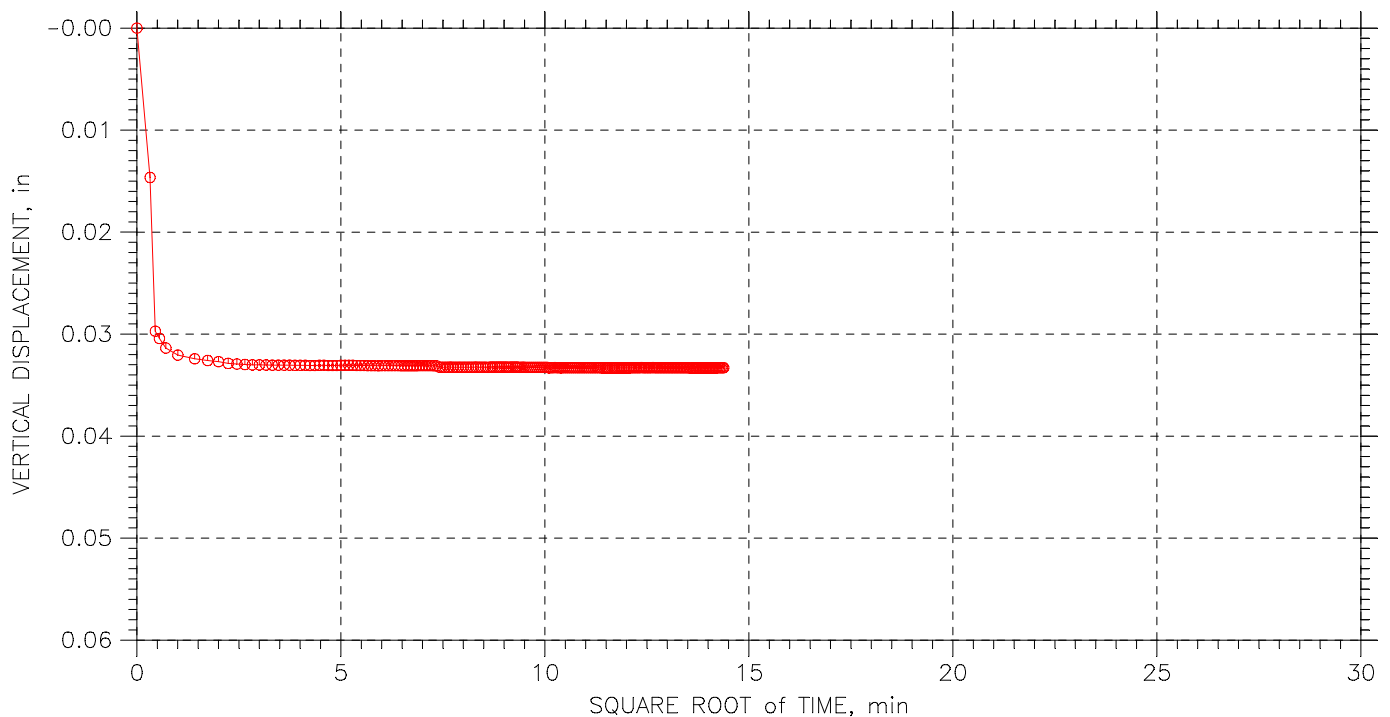
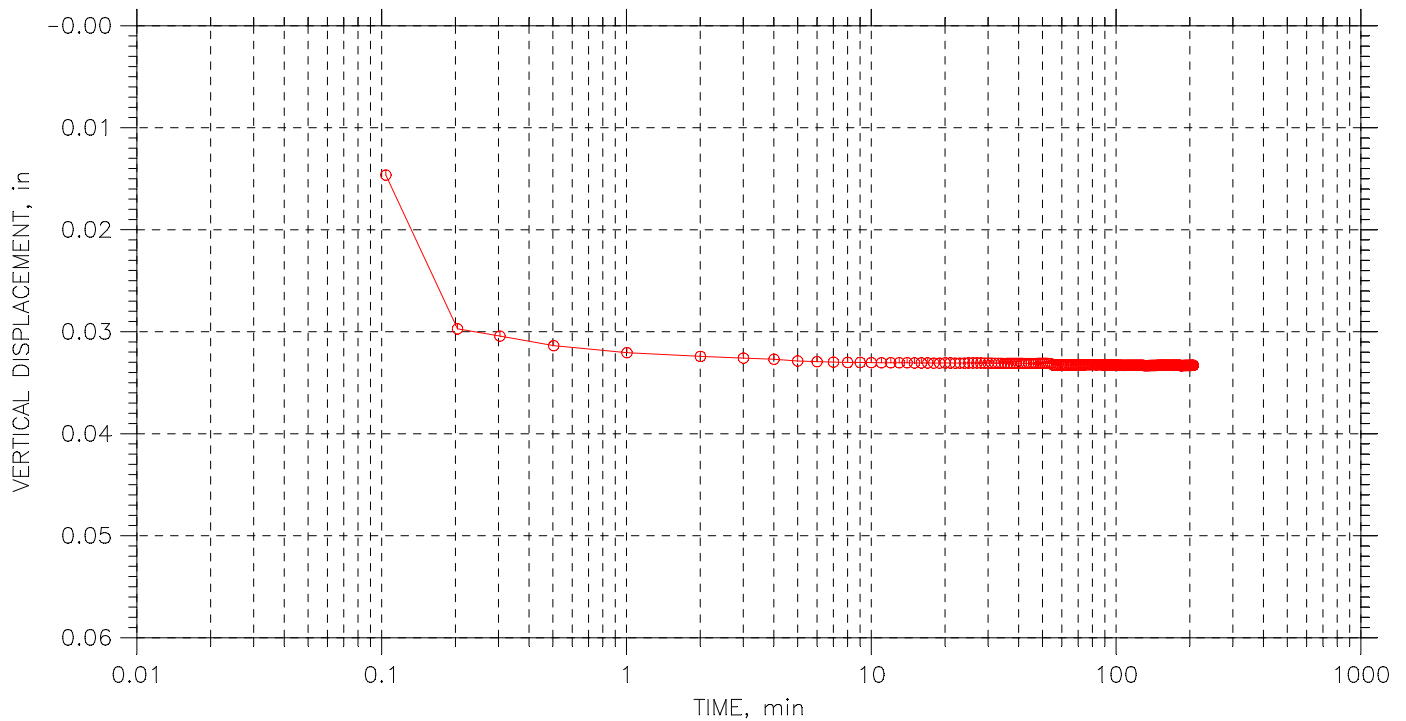
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.5
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Visual :Dark Gray Medium Stiff CLAY with Silt and fine sand Lenses (CH)		
Remarks: Constant Volume (Sample Not Allowed to Swell)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007 Residu		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

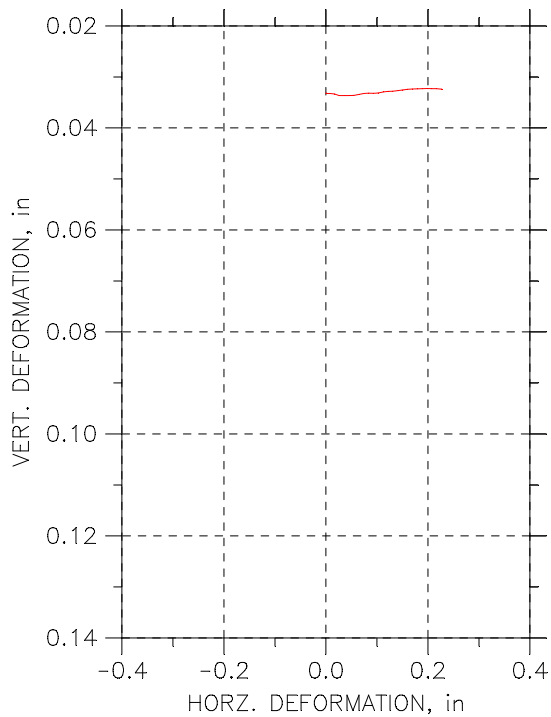
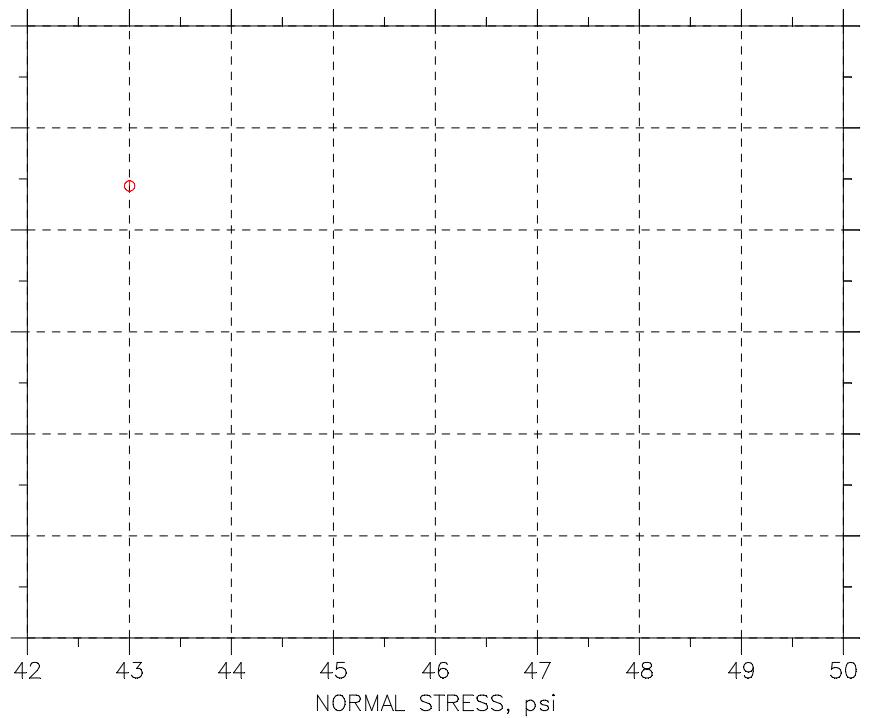
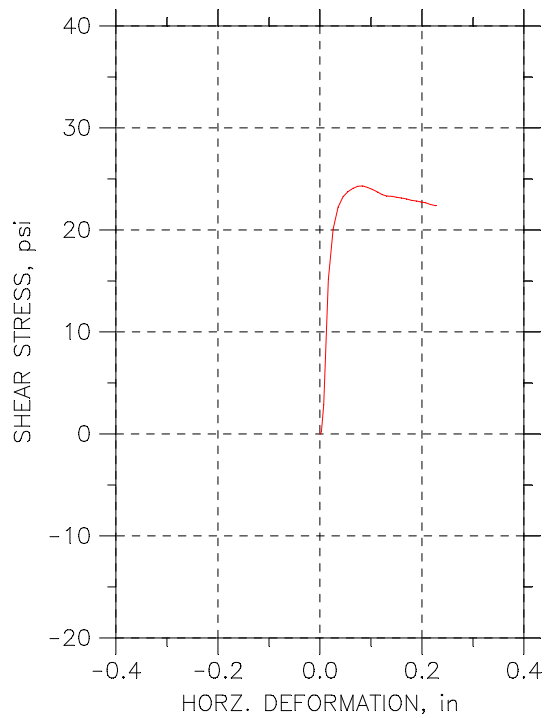
Step: 1 of 1

Stress: 43 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/16/07	Depth: 64.75
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt and fine Sand (CH)		
Remarks: Constant Volume (Sample Not Allowed to Swell)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\August 2007 Residu		

DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-2			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	23.64		
	Dry Density, pcf	105.1		
	Saturation, %	105.76		
	Void Ratio	0.6034		
Consol. Height, in		0.96671		
Consol. Void Ratio		0.55001		
Final	Water Content, %	24.66		
	Dry Density, pcf	120.6		
	Saturation, %	167.23		
	Void Ratio	0.39807		
Normal Stress, psi		43.002		
Max. Shear Stress, psi		24.313		
Ult. Shear Stress, psi		22.375		
Time to Failure, min		9.0034		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		53		
Plastic Limit		24		
Plasticity Index		29		

Project: Purple Line

Location: College Park, MD

Project No.: 14961

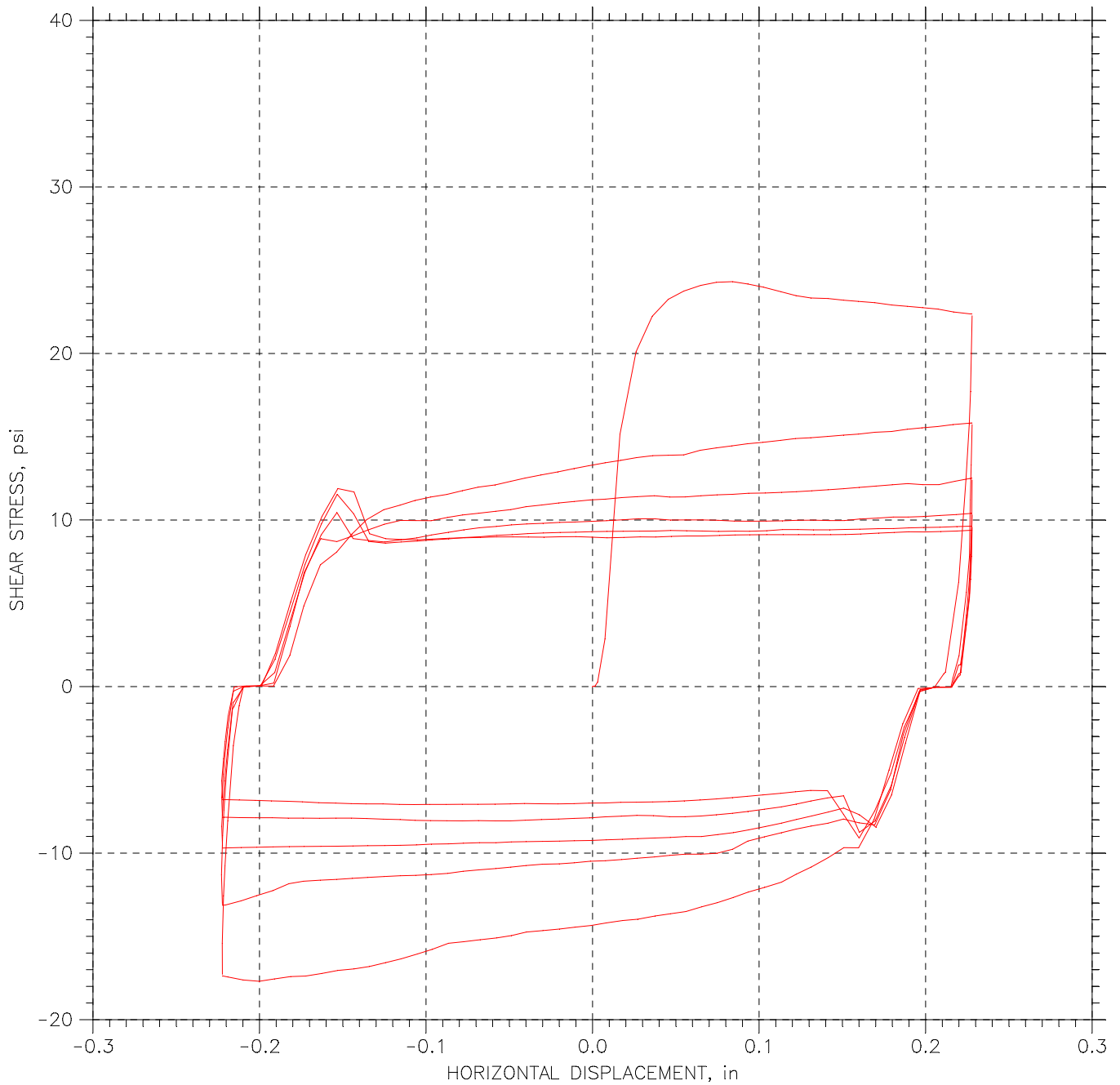
Boring No.: CP-3A

Sample Type: Pitcher

Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt and fine Sand (CH)

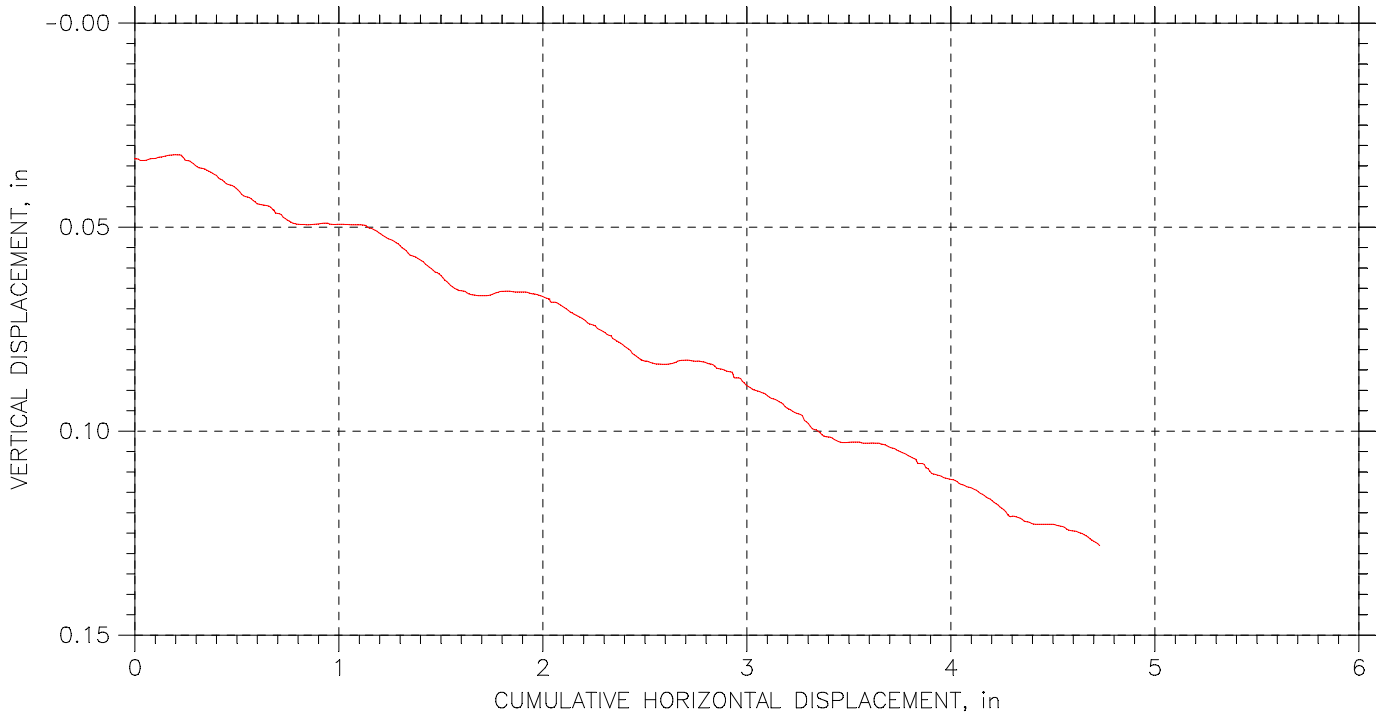
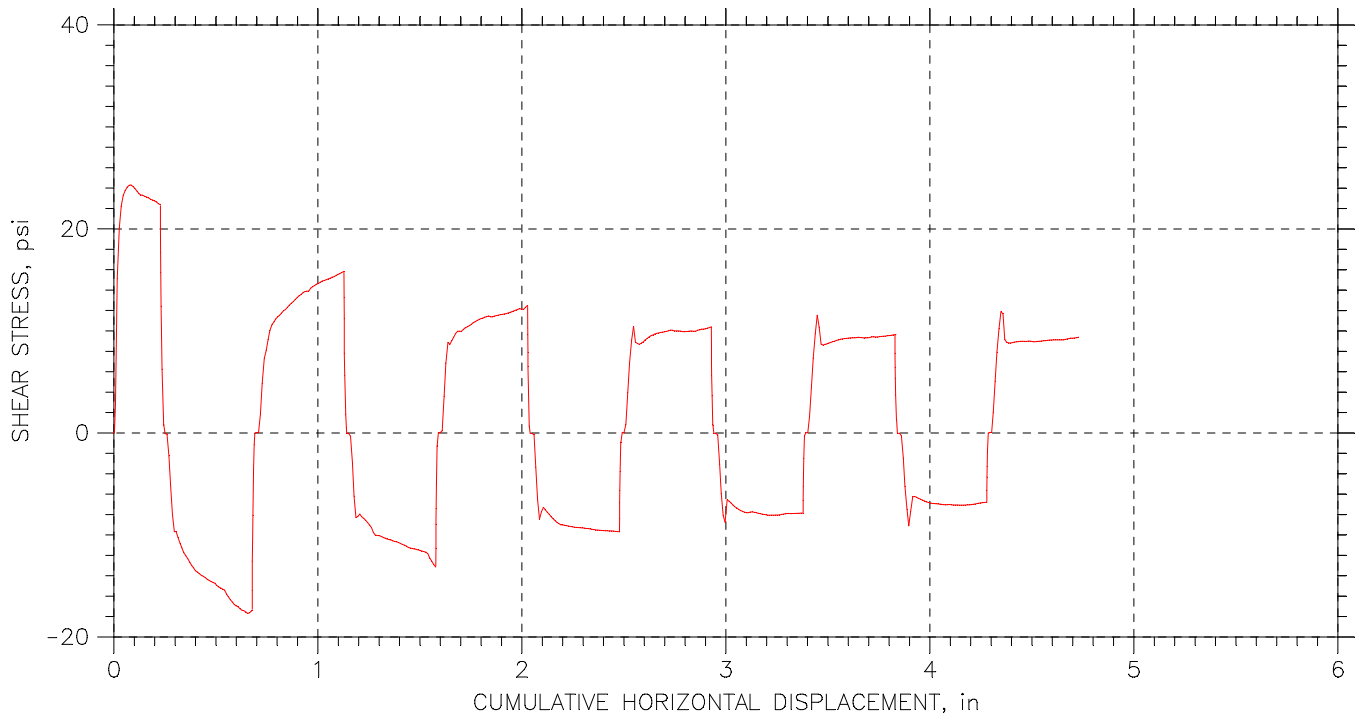
Remarks: Constant Volume (Sample Not Allowed to Swell)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/16/07	Depth: 64.75
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt and fine Sand (CH)		
Remarks: Constant Volume (Sample Not Allowed to Swell)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007 Residu		

RESIDUAL SHEAR TEST



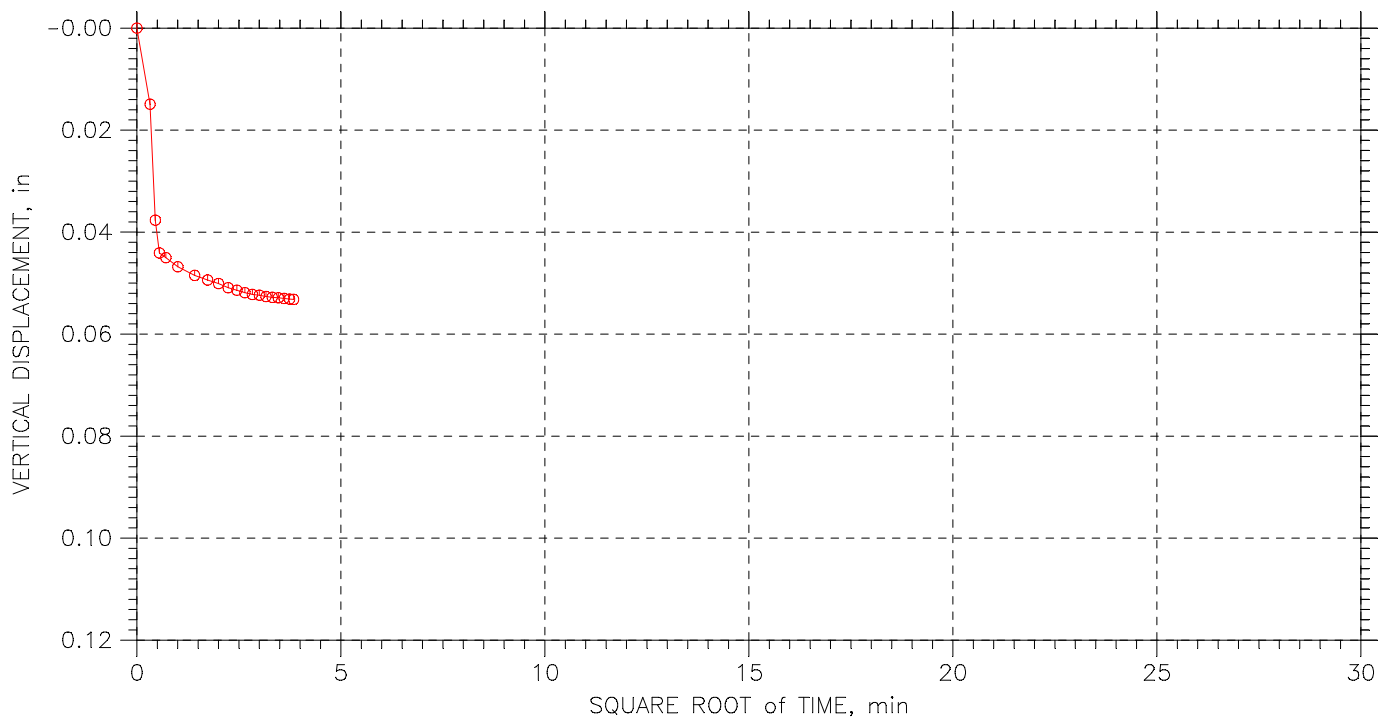
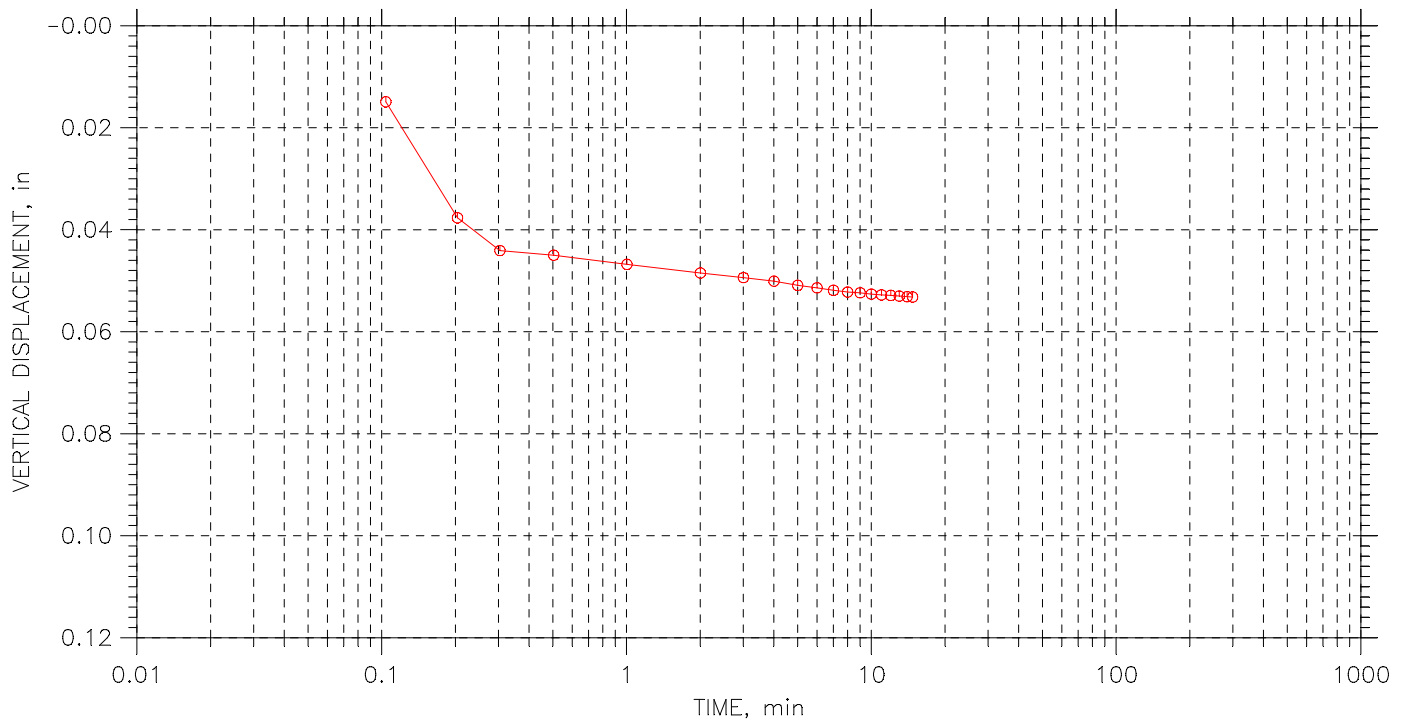
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/16/07	Depth: 64.75
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt and fine Sand (CH)		
Remarks: Constant Volume (Sample Not Allowed to Swell)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007 Residu		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 2

Stress: 43 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.9
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt Lenses and fine sand (CH)		
Remarks: Constant Volume (Not Allowed To Swell)		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007		

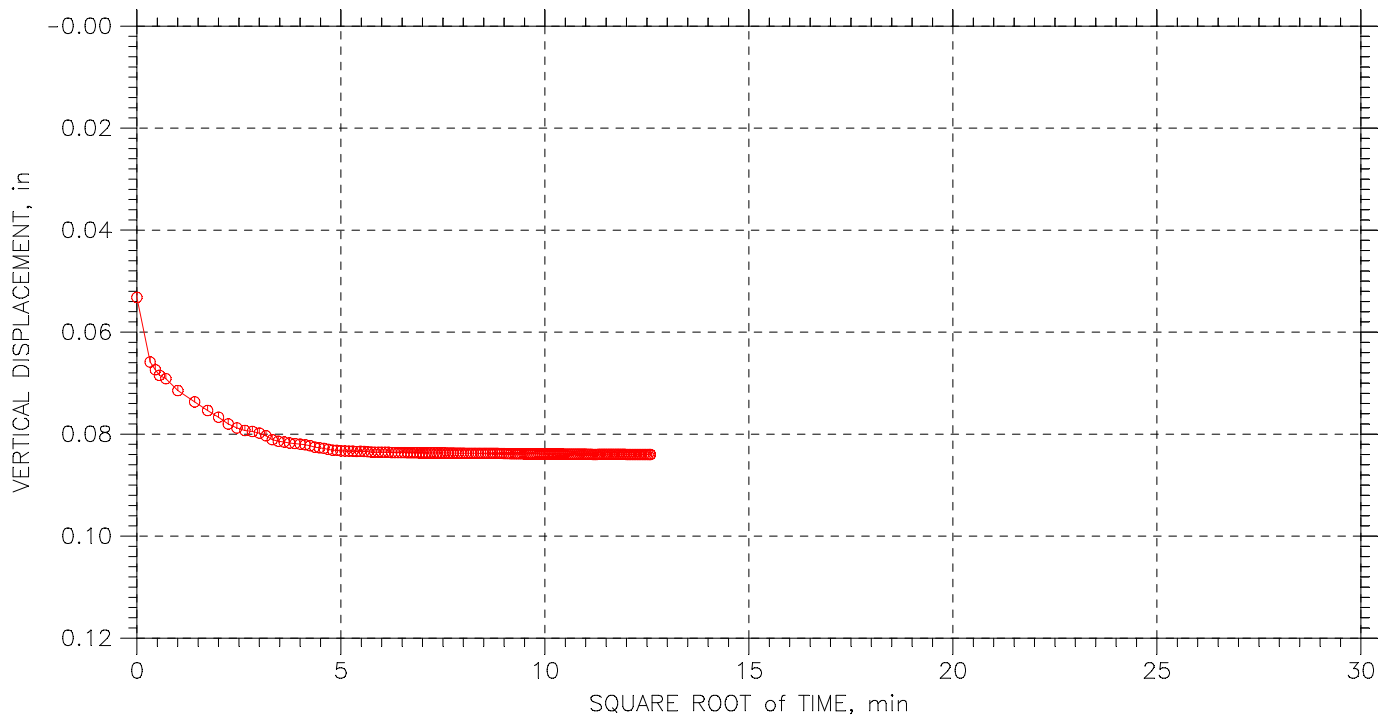
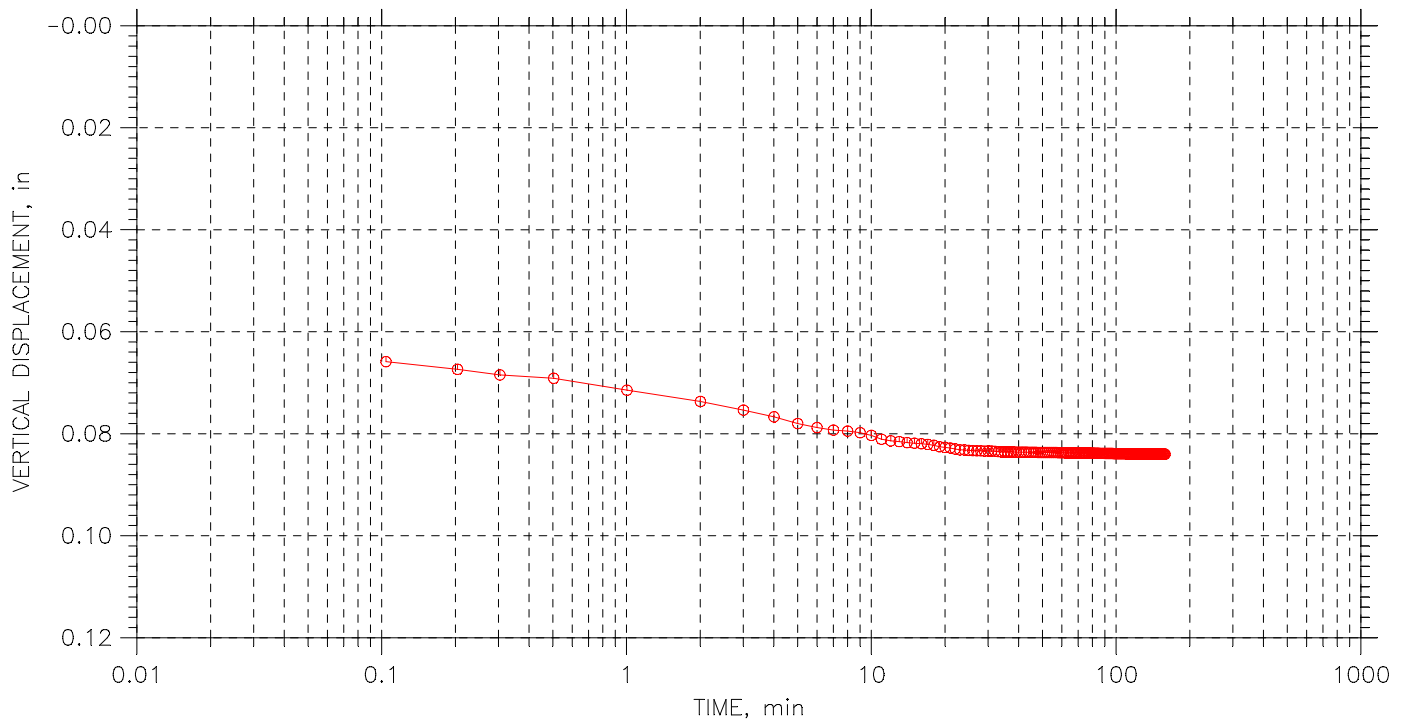
Residu

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 2 of 2

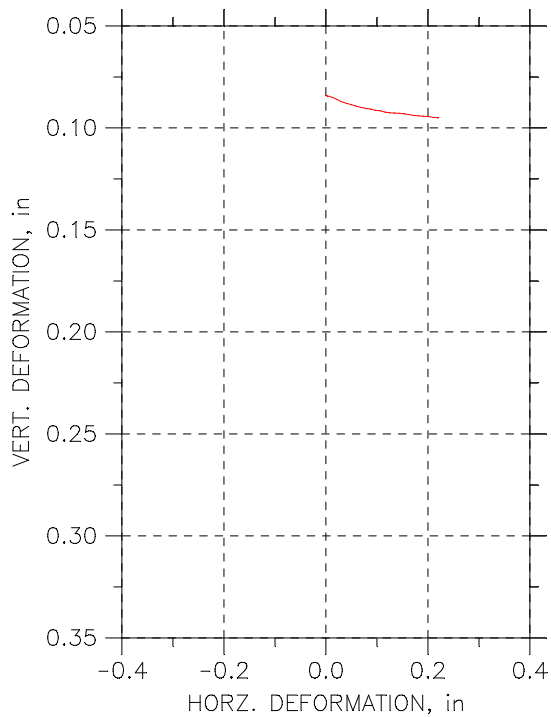
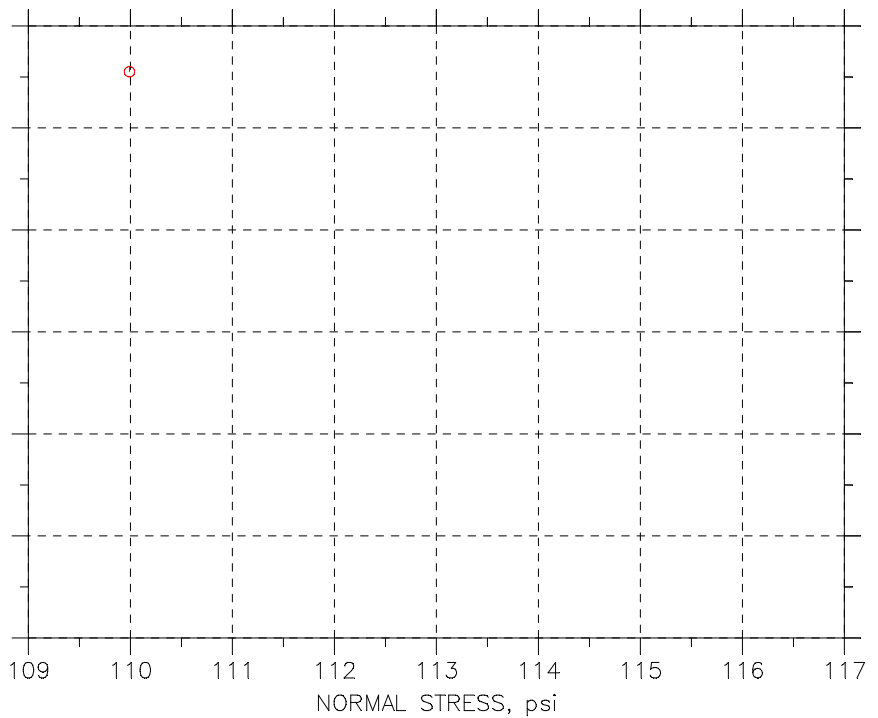
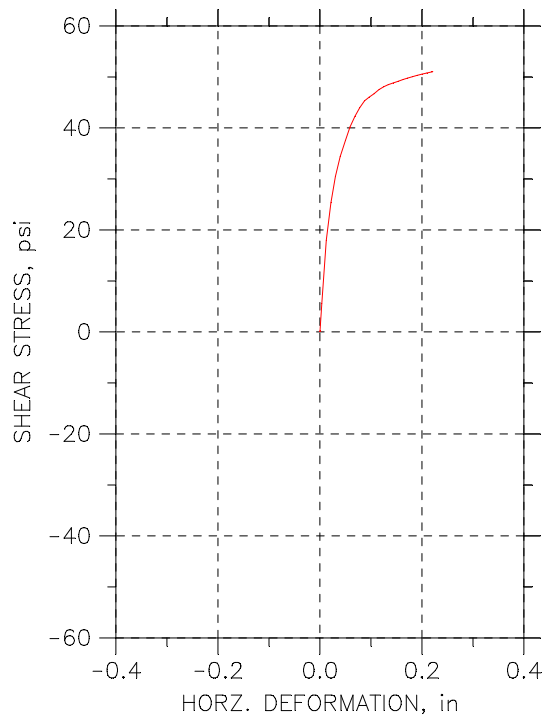
Stress: 110 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.9
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt Lenses and fine sand (CH)		
Remarks: Constant Volume (Not Allowed To Swell)		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007		

Residu

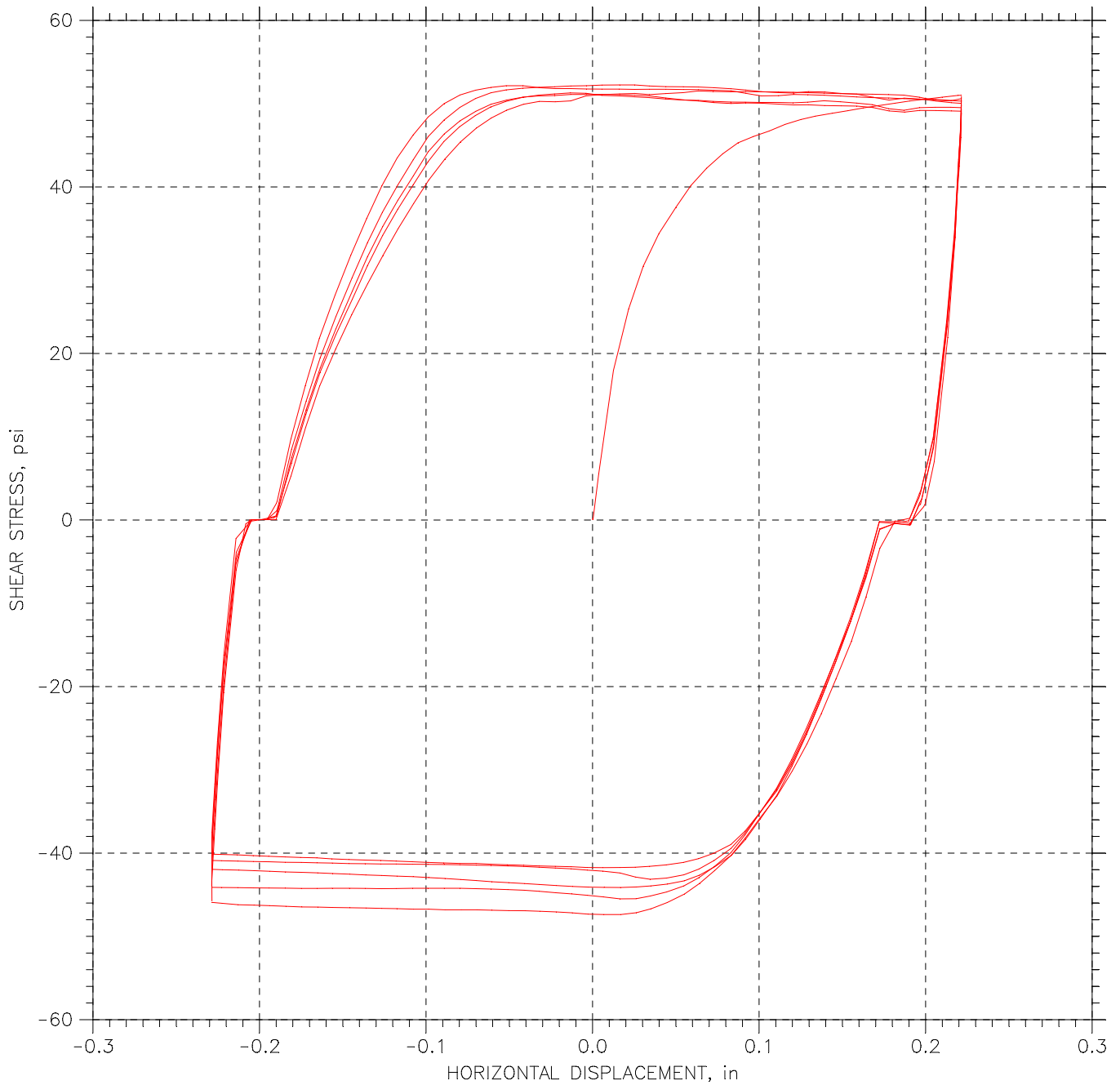
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-3			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	20.38		
	Dry Density, pcf	114.1		
	Saturation, %	115.33		
	Void Ratio	0.47713		
Consol. Height, in		0.91599		
Consol. Void Ratio		0.35304		
Final	Water Content, %	17.40		
	Dry Density, pcf	157.9		
	Saturation, %	692.95		
	Void Ratio	0.067805		
Normal Stress, psi		109.99		
Max. Shear Stress, psi		51.011		
Ult. Shear Stress, psi		51.011		
Time to Failure, min		24.148		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		53		
Plastic Limit		24		
Plasticity Index		29		

Project: Purple Line
 Location: College Park,MD
 Project No.: 14961
 Boring No.: CP-3A
 Sample Type: Pitcher
 Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt Lenses and fine sand (CH)
 Remarks: Constant Volume (Not Allowed To Swell)

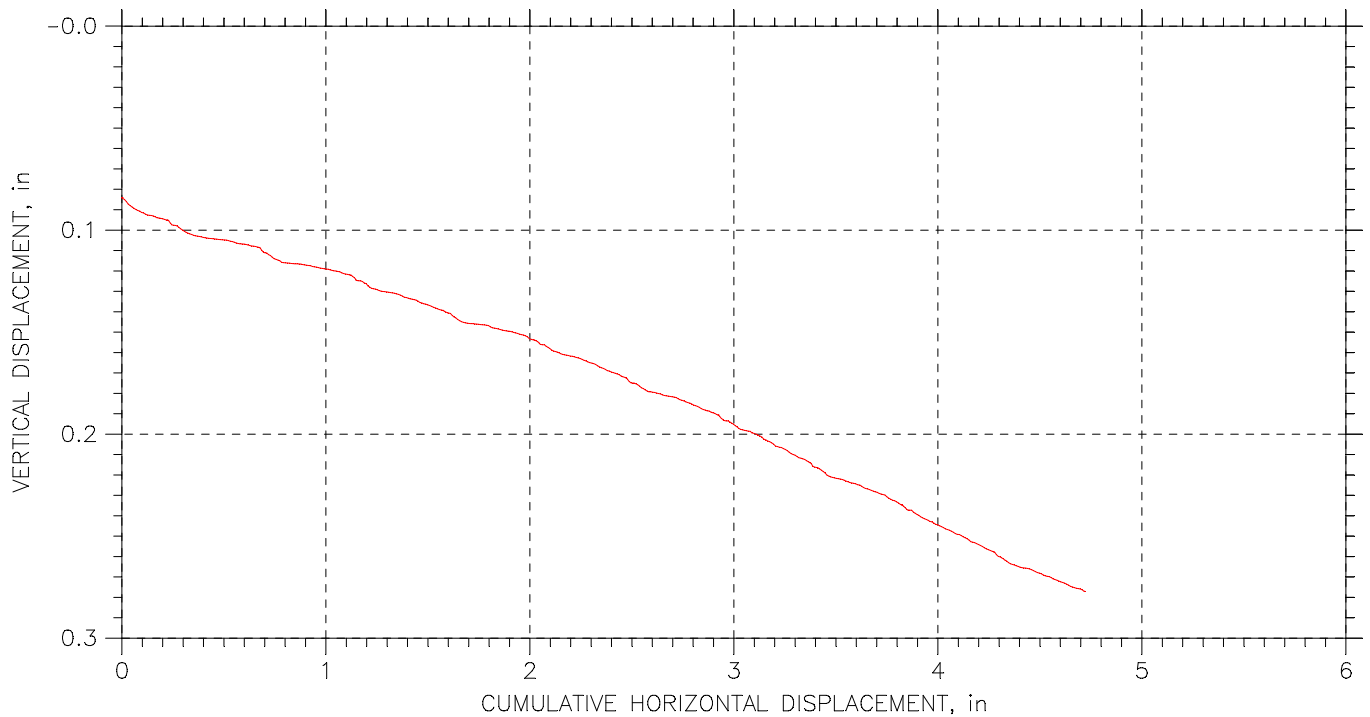
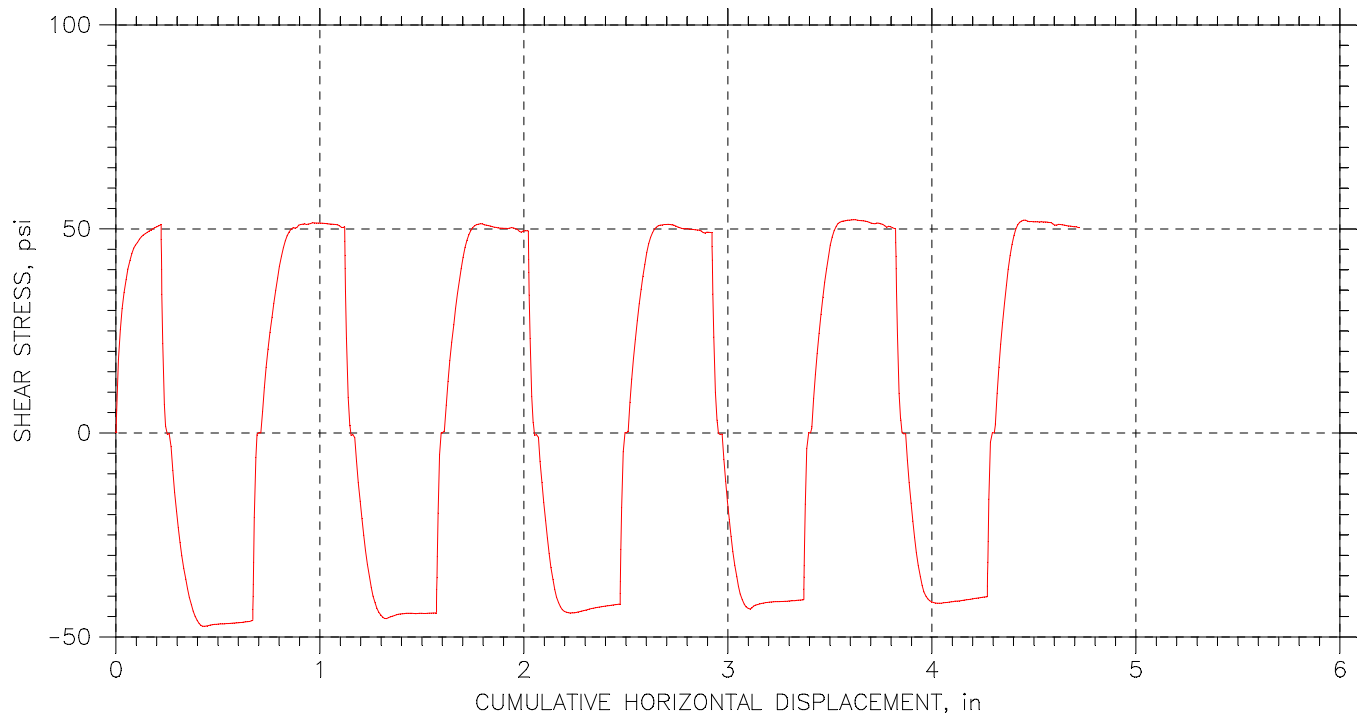
RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.9
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt Lenses and fine sand (CH)		
Remarks: Constant Volume (Not Allowed To Swell)		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007		

Residu

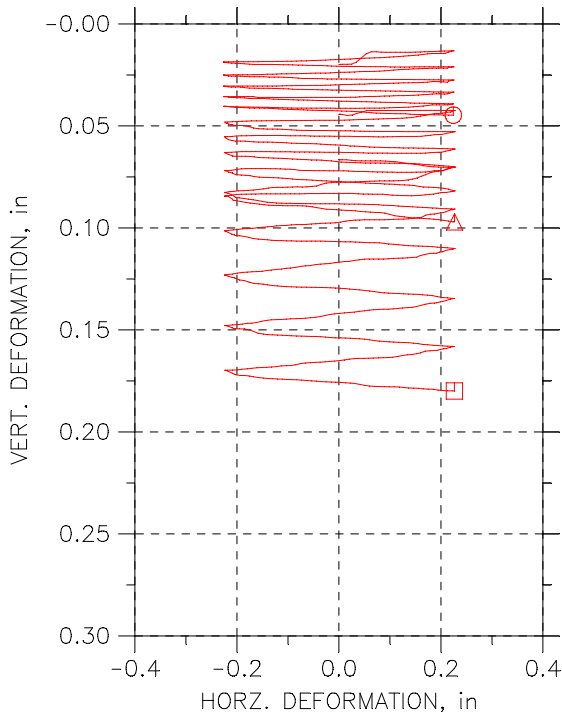
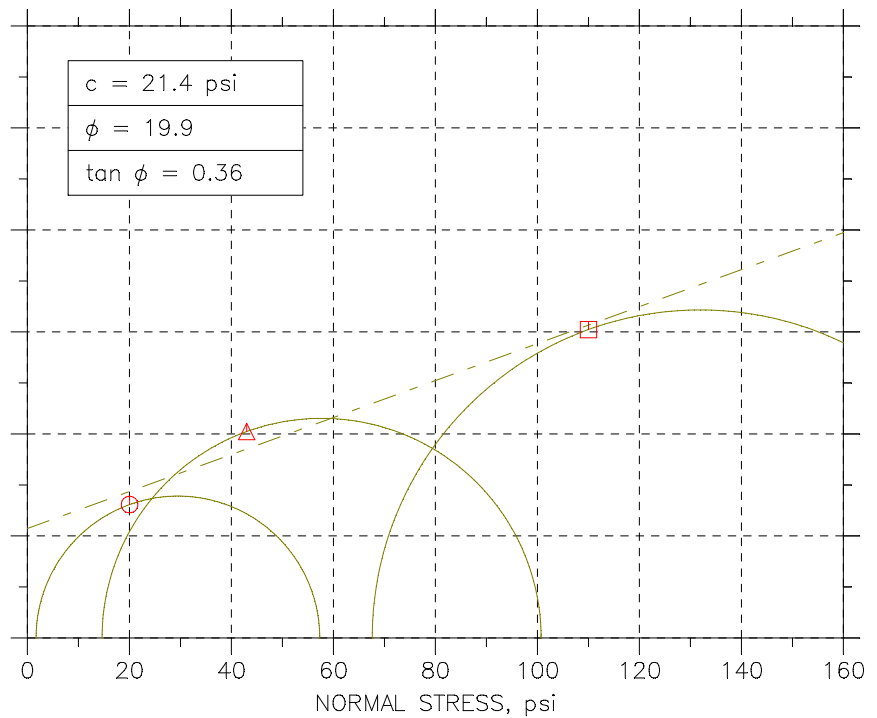
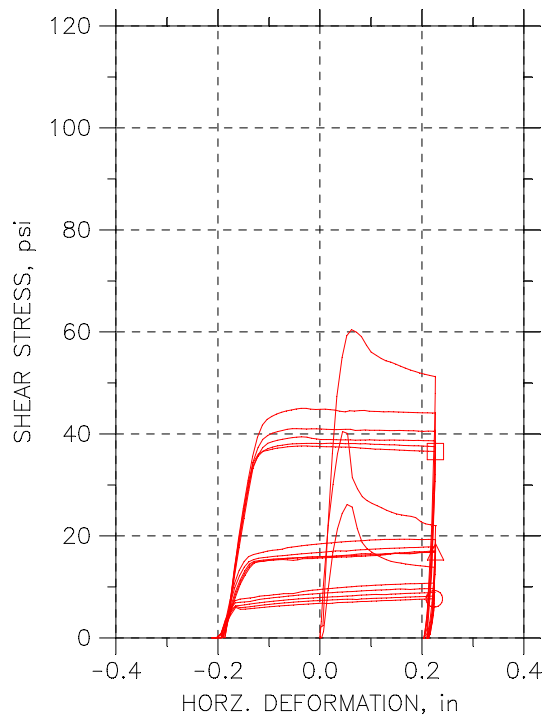
RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/15/07	Depth: 64.9
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: VISUAL: Dark Gray Medium Stiff CLAY with Silt Lenses and fine sand (CH)		
Remarks: Constant Volume (Not Allowed To Swell)		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\August 2007		

Residu

DIRECT SHEAR TEST REPORT



Symbol	⊖	△	□	
Test No.	B-1	B-2	B-3	
Sample No.	P-3	P-3	P-3	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	21.51	20.66	27.54
	Dry Density, pcf	110.38	111.38	104.48
	Saturation, %	110.21	108.65	121.27
	Void Ratio	0.527	0.51328	0.61324
Consol. Height, in		0.98017	0.95576	0.93341
Consol. Void Ratio		0.49673	0.44633	0.50582
Final	Water Content, %	18.69	19.82	19.42
	Dry Density, pcf	115.55	123.36	127.41
	Saturation, %	110.01	146.06	162.32
	Void Ratio	0.45876	0.36639	0.32298
Normal Stress, psi		20.024	43.002	110
Max. Shear Stress, psi		26.143	40.469	60.459
Res Shear Stress, psi		7.6682	16.877	36.544
Time to Failure, min		6.0037	5.0035	7.0035
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		53	53	53
Plastic Limit		24	24	24
Plasticity Index		29	29	29

Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-3A
 Sample Type: Pitcher

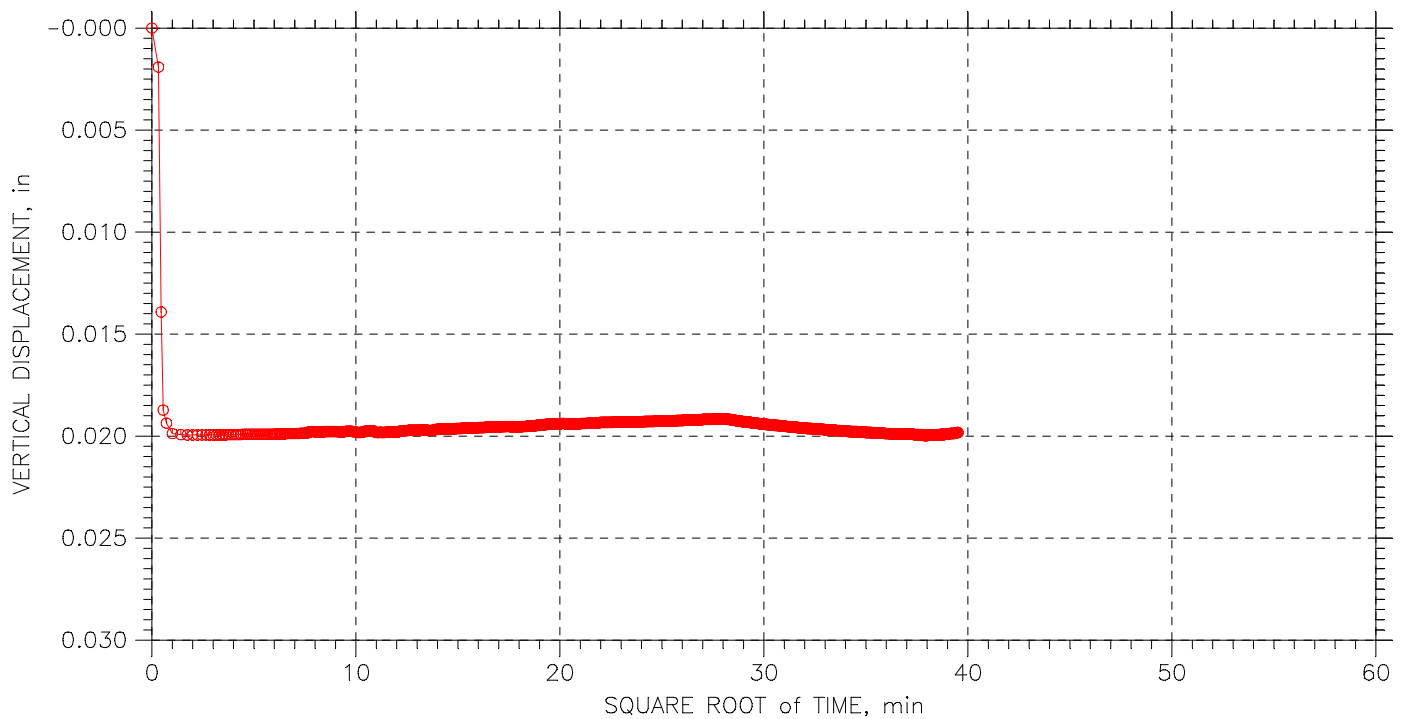
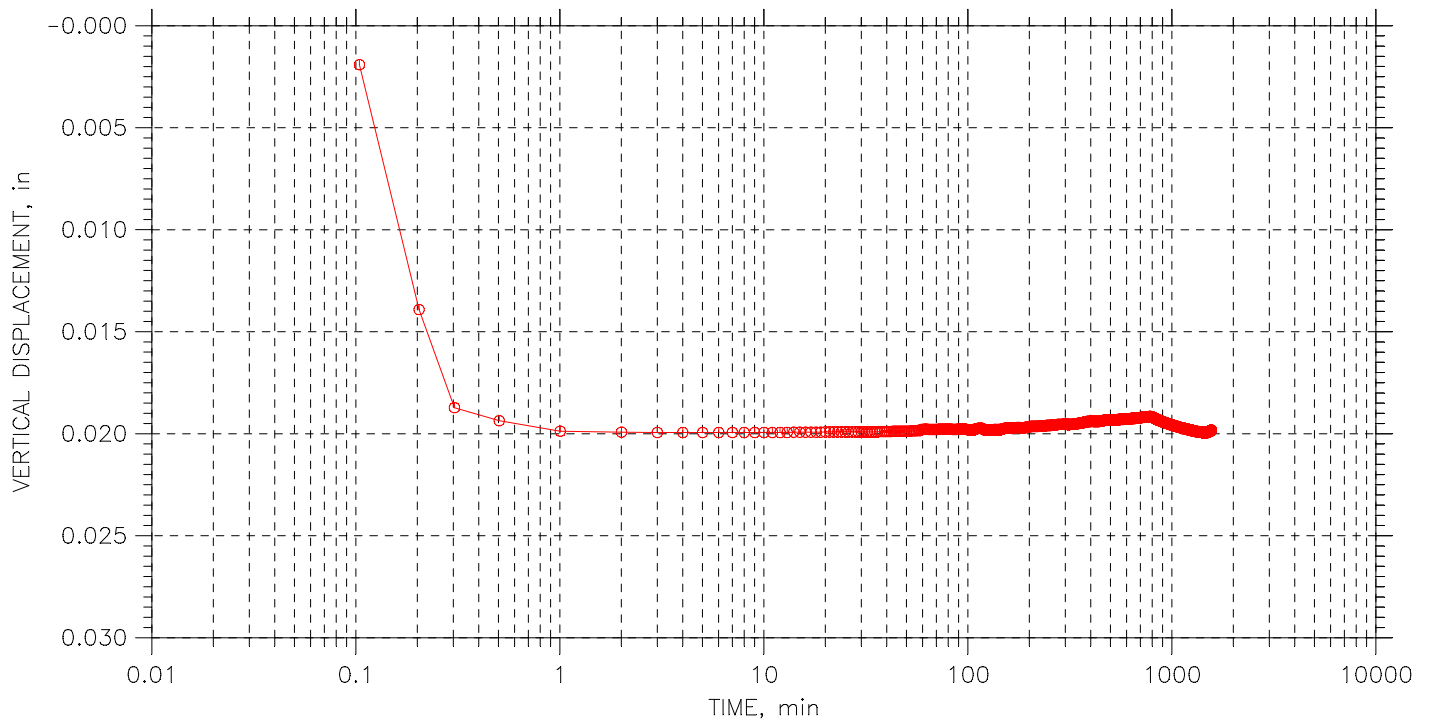
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine sand lenses (CH)
 Remarks: Constant Load (Sample allowed to swell prior to testing)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

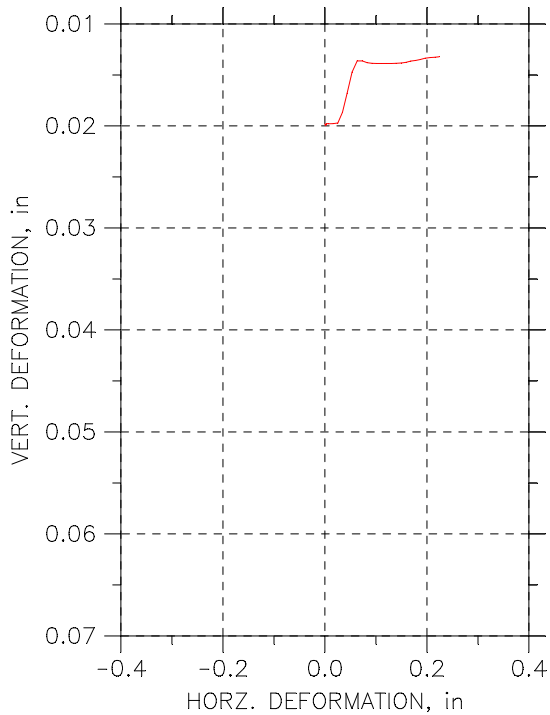
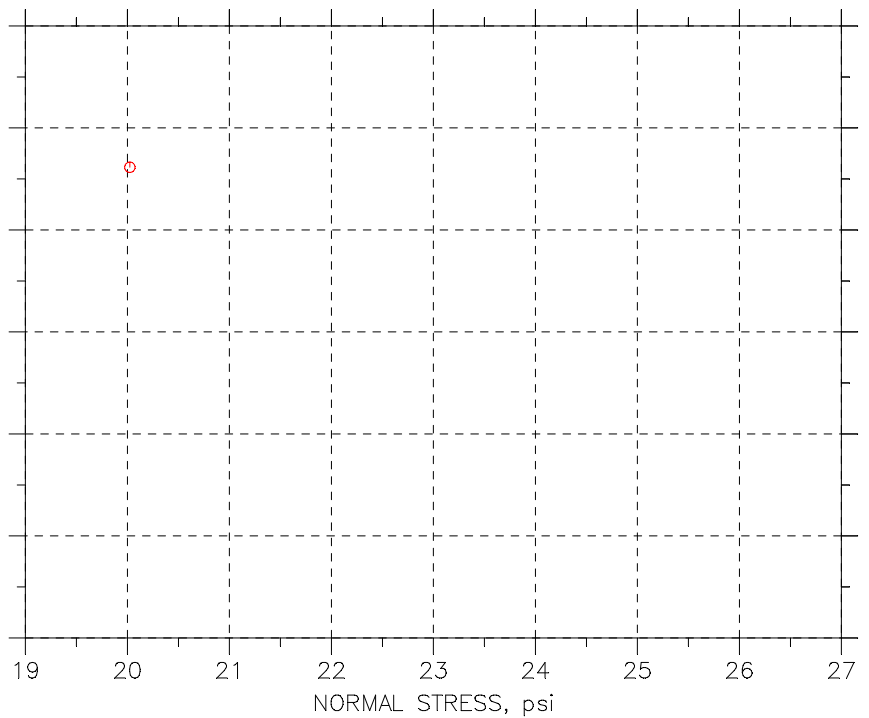
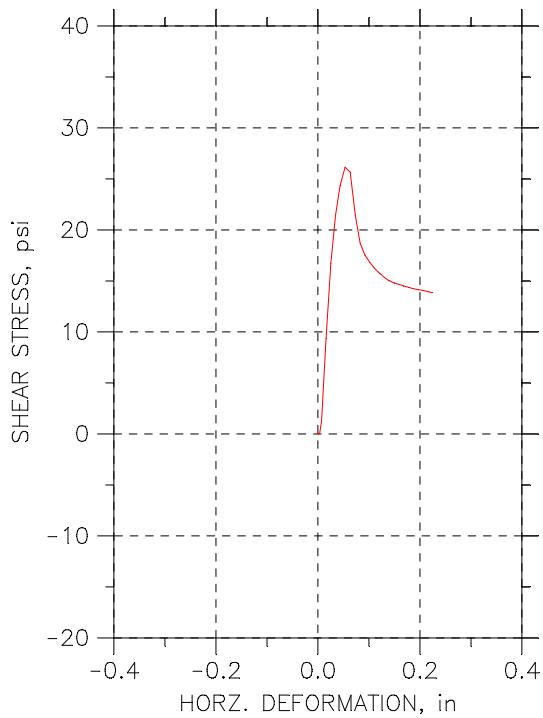
Step: 1 of 1

Stress: 20 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/30/07	Depth: 64.0'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-3 P-3 20 PSI cons		

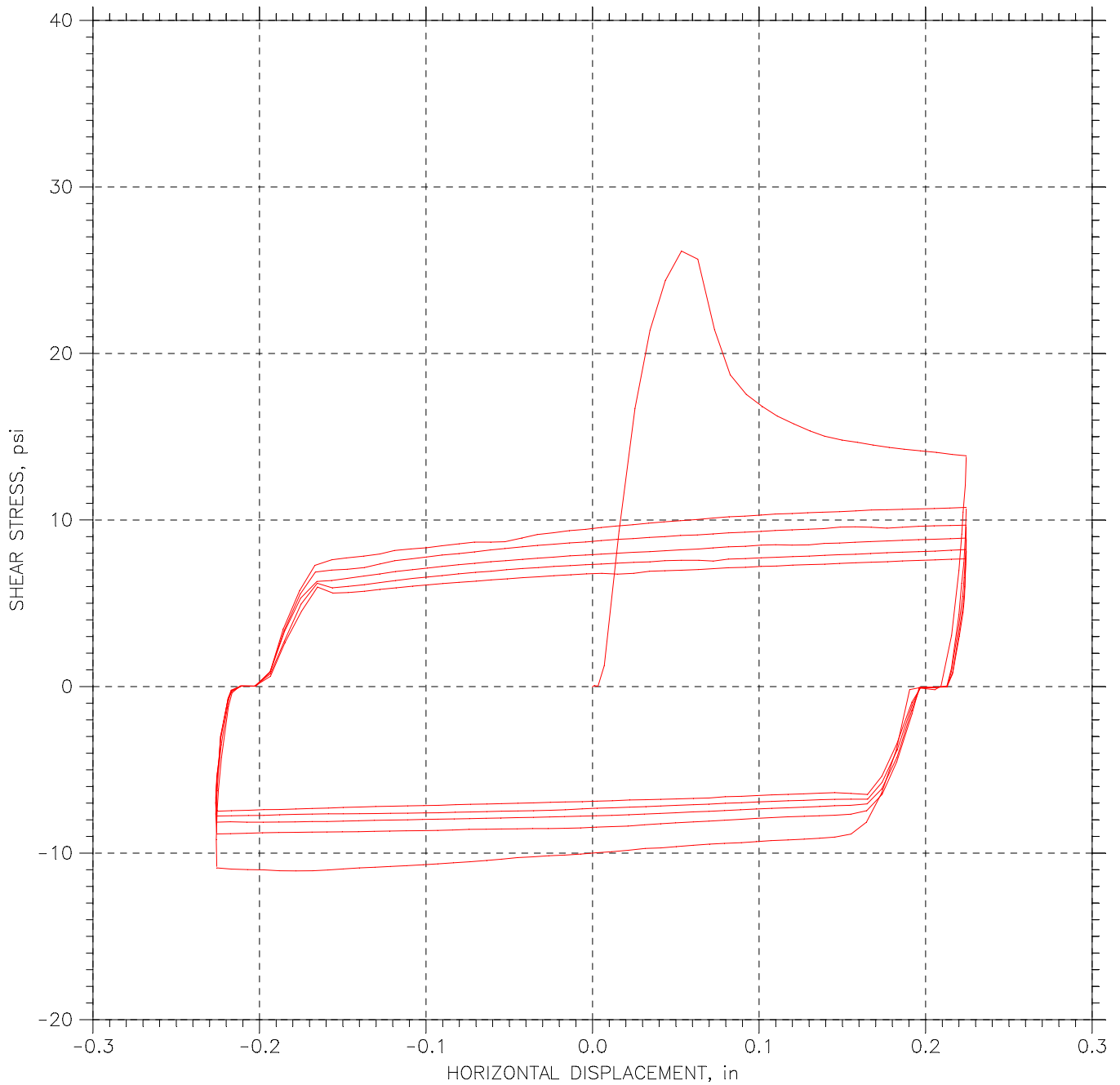
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-1			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	21.51		
	Dry Density, pcf	110.4		
	Saturation, %	110.21		
	Void Ratio	0.527		
Consol. Height, in		0.98017		
Consol. Void Ratio		0.49673		
Final	Water Content, %	18.69		
	Dry Density, pcf	115.5		
	Saturation, %	110.01		
	Void Ratio	0.45876		
Normal Stress, psi		20.024		
Max. Shear Stress, psi		26.143		
Res Shear Stress, psi		13.854		
Time to Failure, min		6.0037		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		53		
Plastic Limit		24		
Plasticity Index		29		

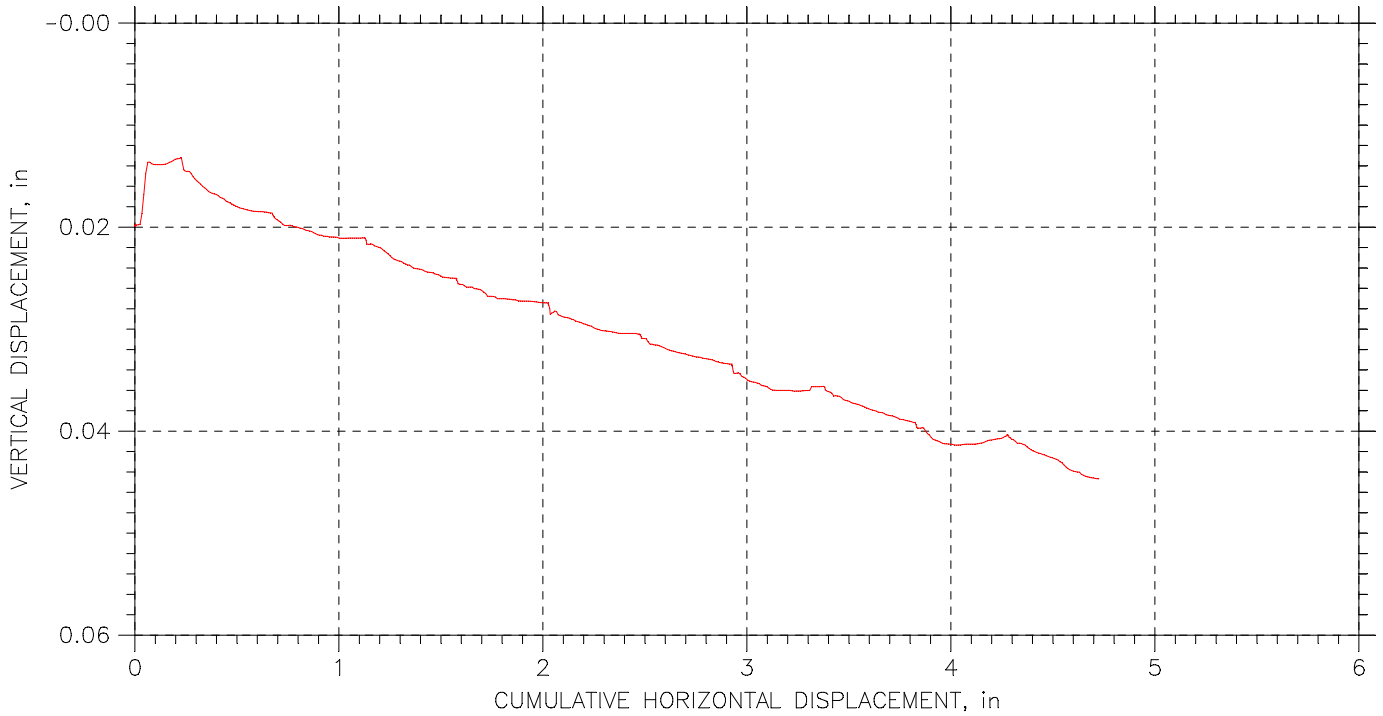
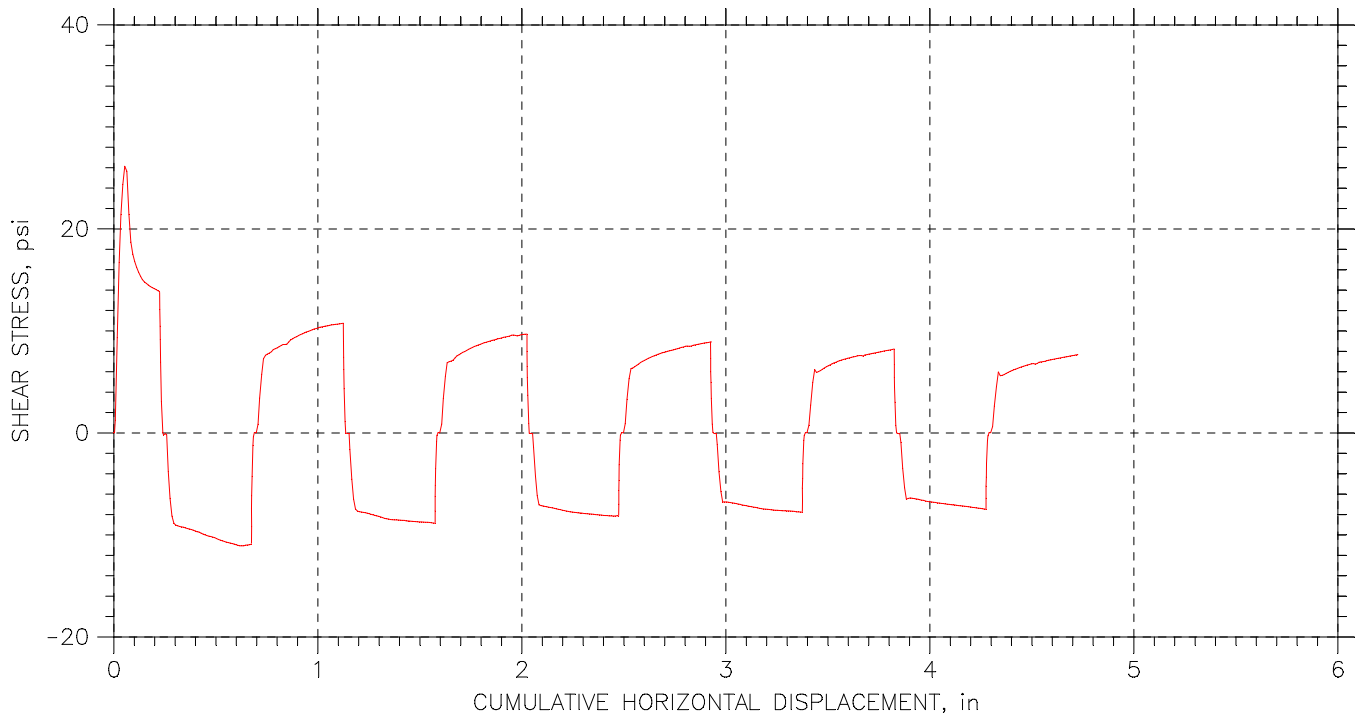
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine sand lenses (CH)	
Remarks: Constant Load (Sample allowed to swell prior to testing)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/30/07	Depth: 64.0'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
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RESIDUAL SHEAR TEST



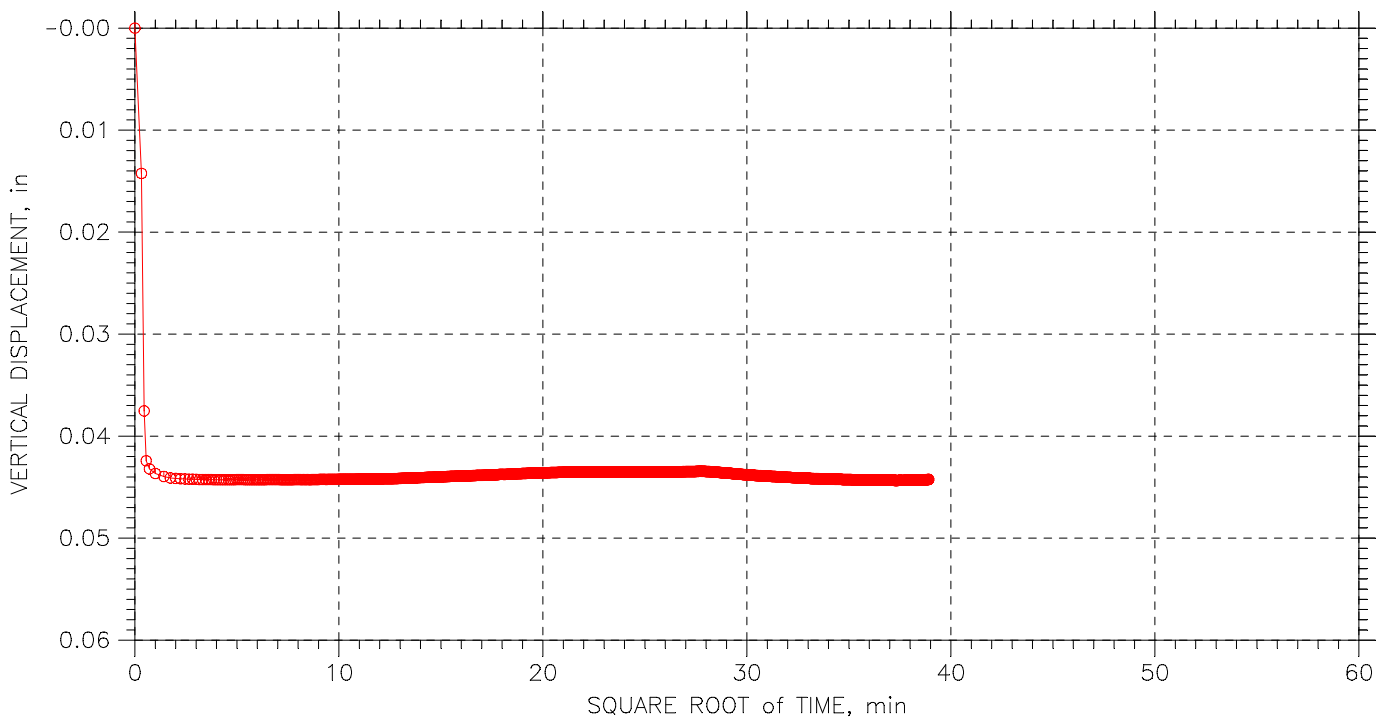
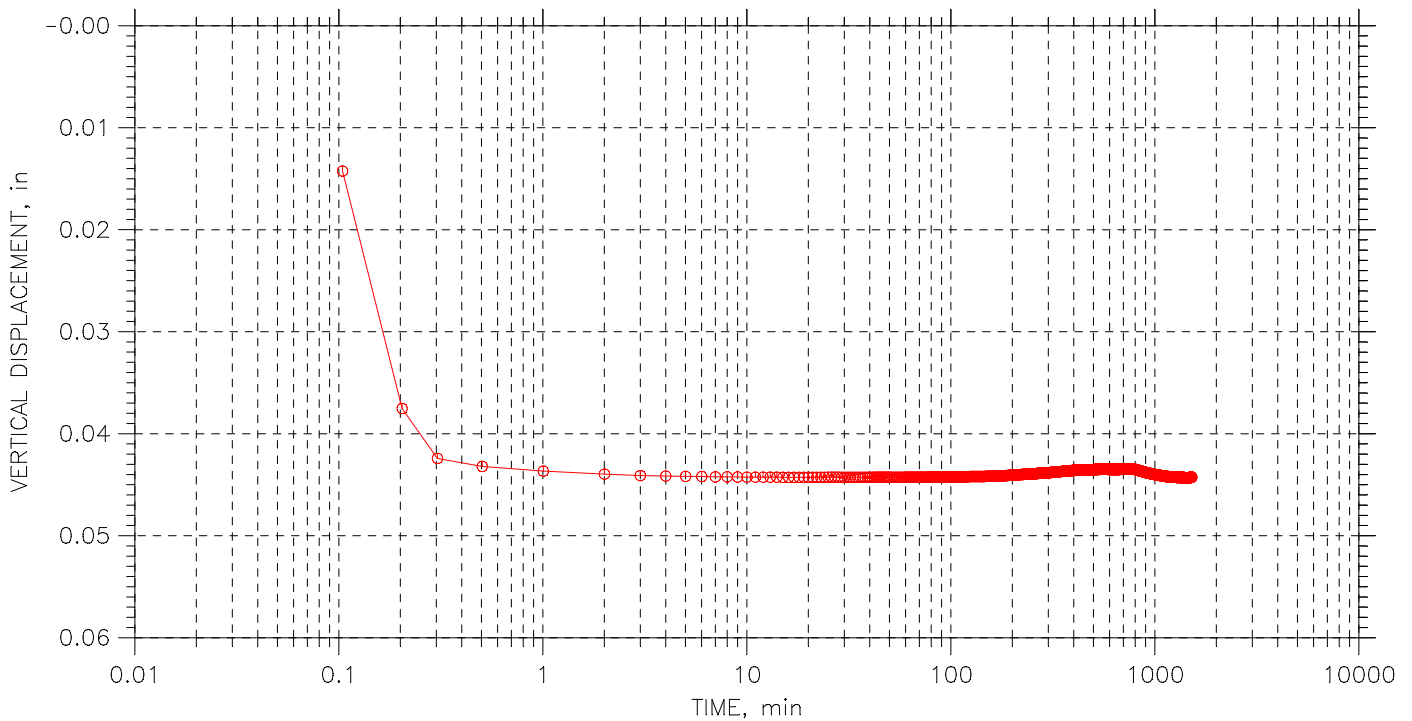
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/30/07	Depth: 64.0'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-3 P-3 20 PSI cons		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

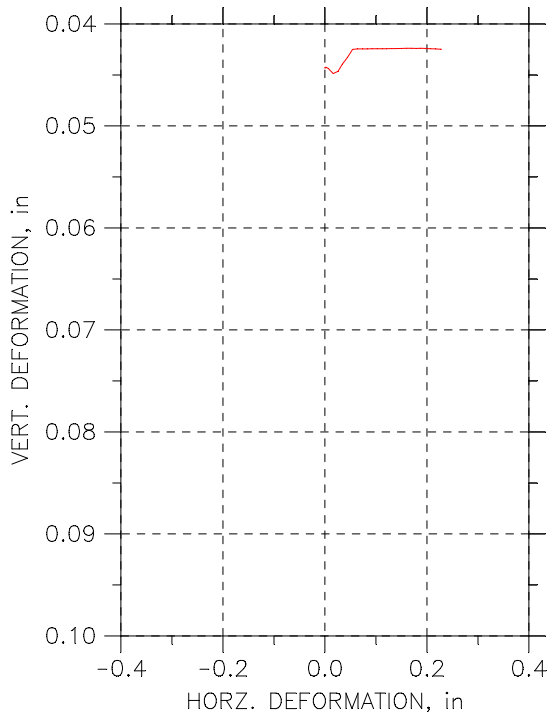
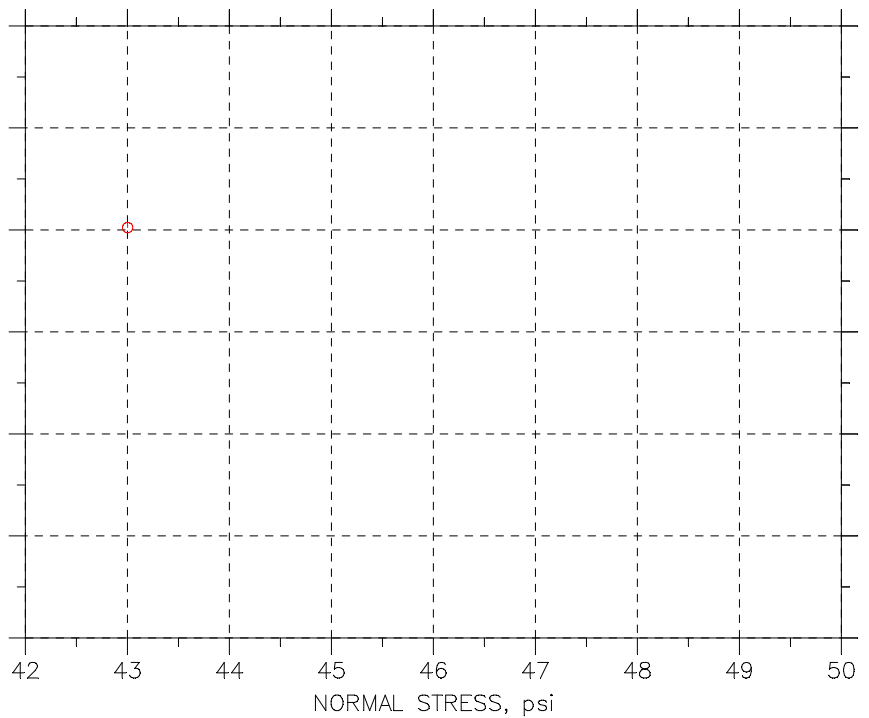
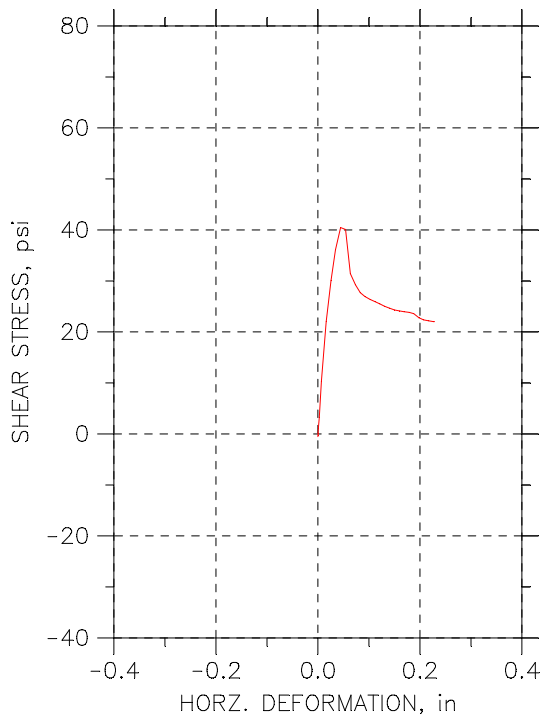
Step: 1 of 1

Stress: 43 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/30/07	Depth: 63.9'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-3 P-3 43 PSI cons		

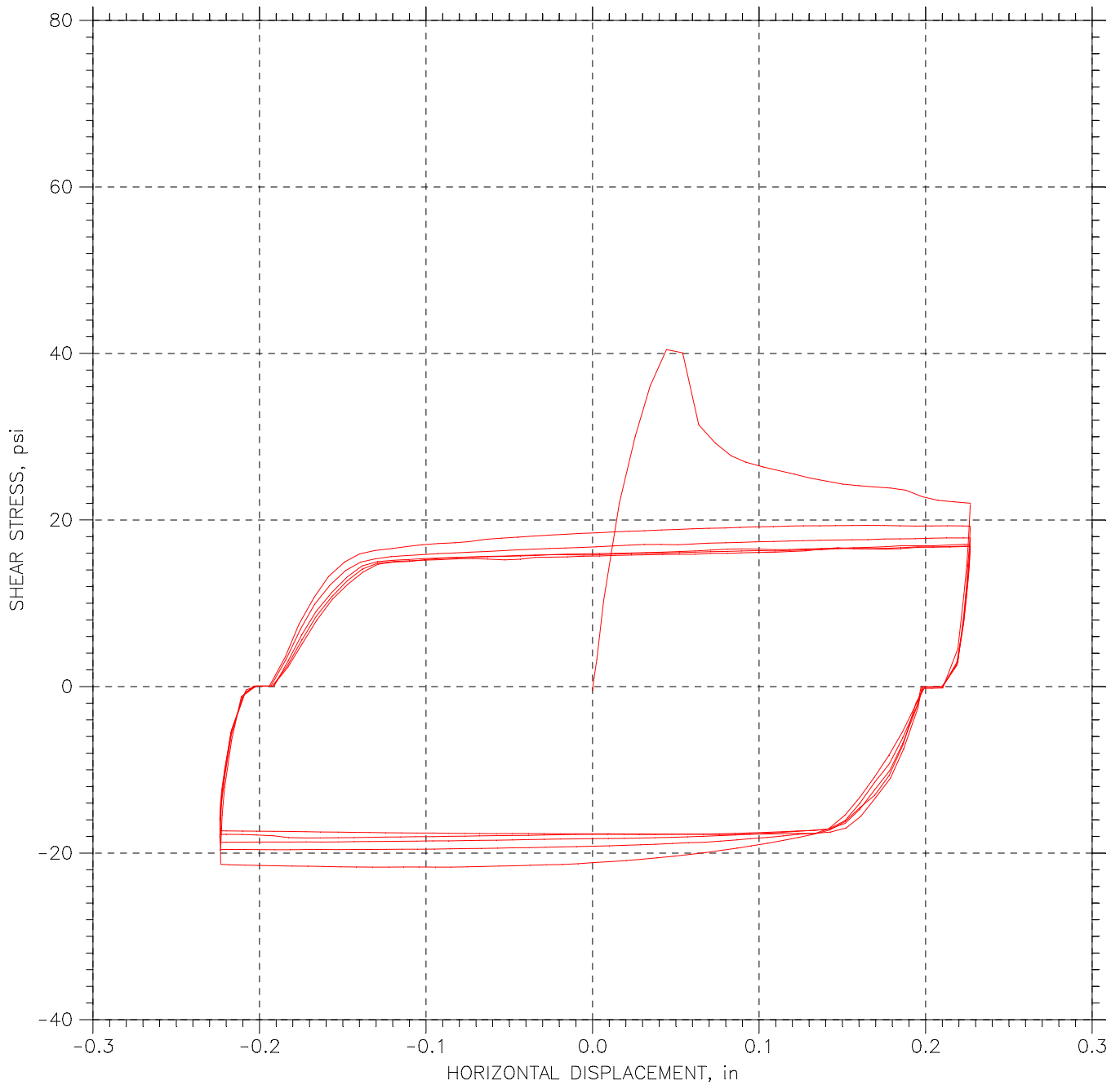
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-2			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	20.66		
	Dry Density, pcf	111.4		
	Saturation, %	108.65		
	Void Ratio	0.51328		
Consol. Height, in		0.95576		
Consol. Void Ratio		0.44633		
Final	Water Content, %	19.82		
	Dry Density, pcf	123.4		
	Saturation, %	146.06		
	Void Ratio	0.36639		
Normal Stress, psi		43.002		
Max. Shear Stress, psi		40.469		
Res Shear Stress, psi		22.011		
Time to Failure, min		5.0035		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		53		
Plastic Limit		24		
Plasticity Index		29		

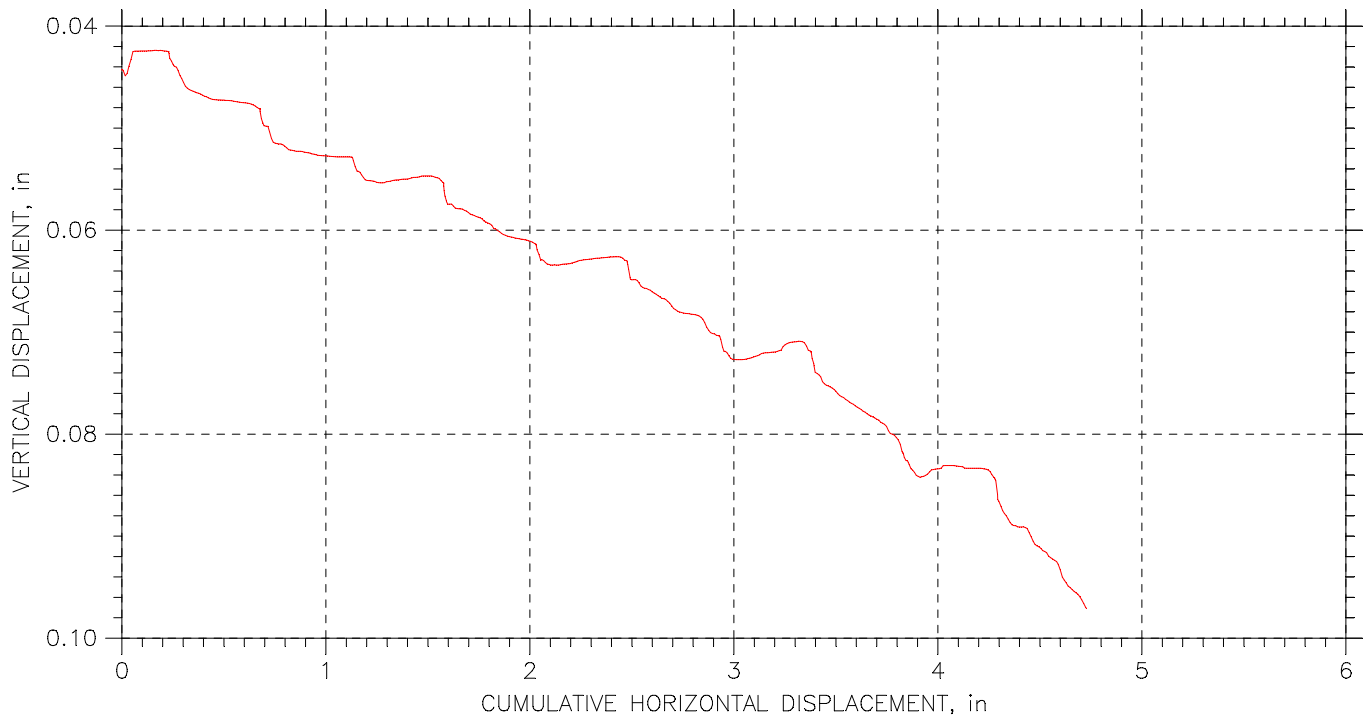
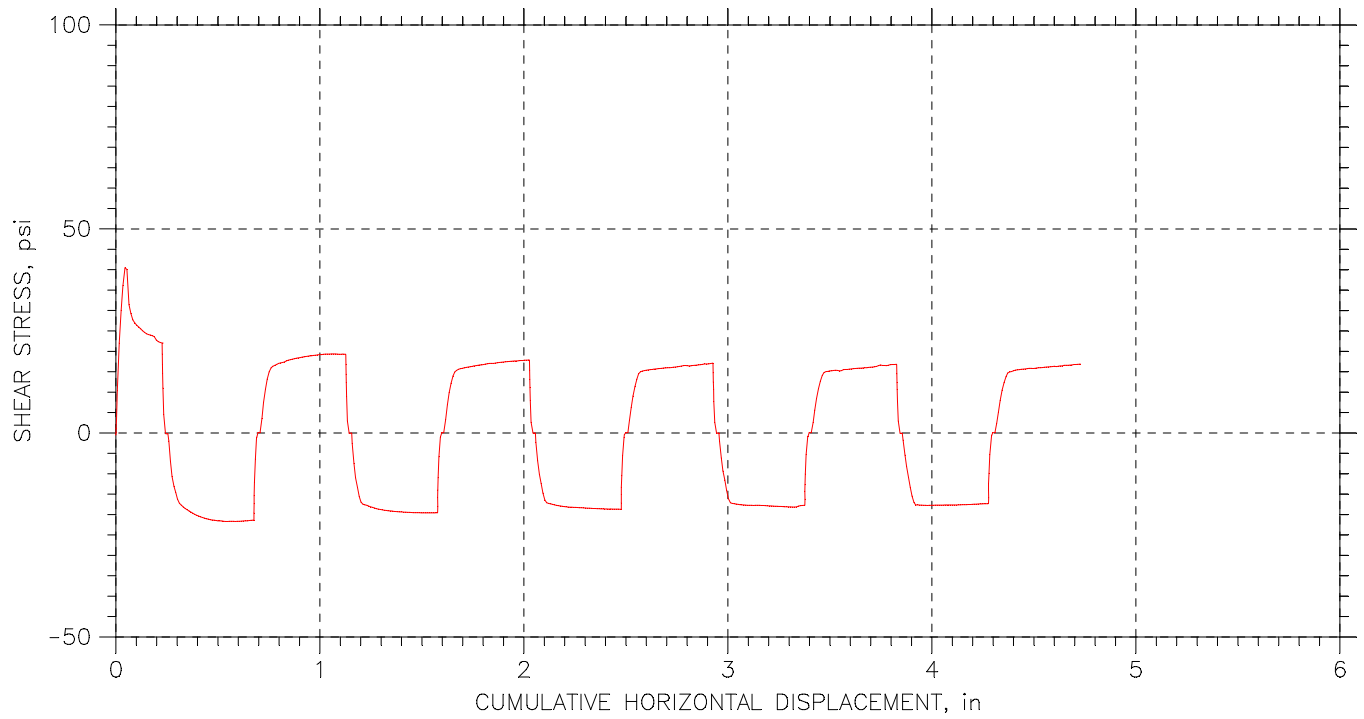
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)	
Remarks: Constant Load (Sample allowed to swell prior to testing)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/30/07	Depth: 63.9'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
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RESIDUAL SHEAR TEST



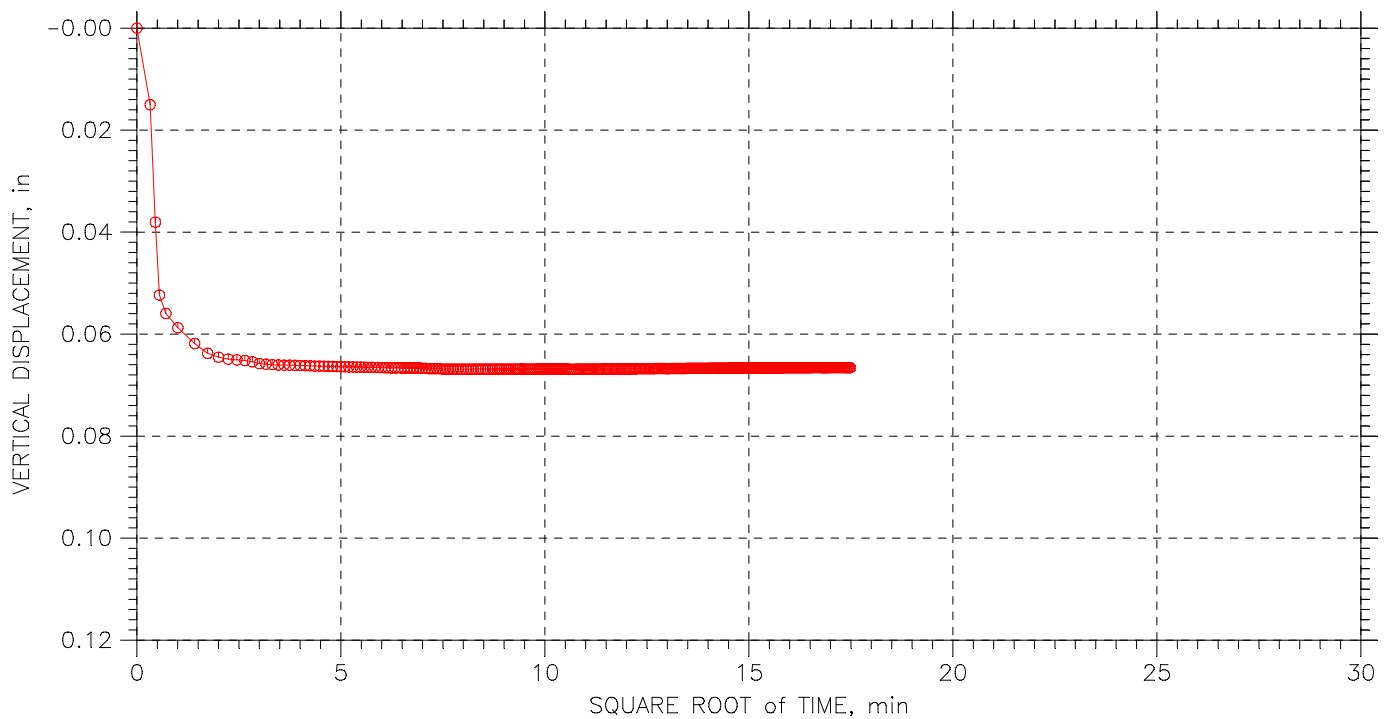
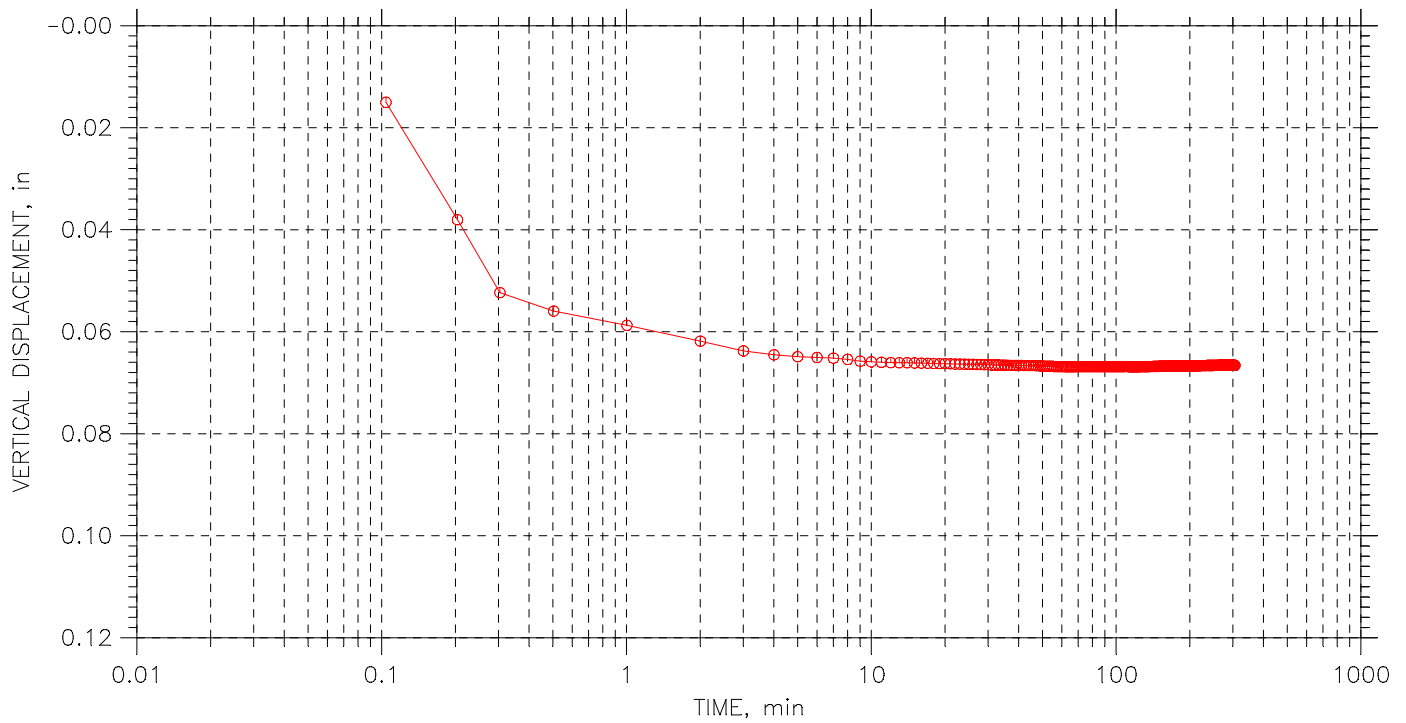
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 8/30/07	Depth: 63.9'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-3 P-3 43 PSI cons		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

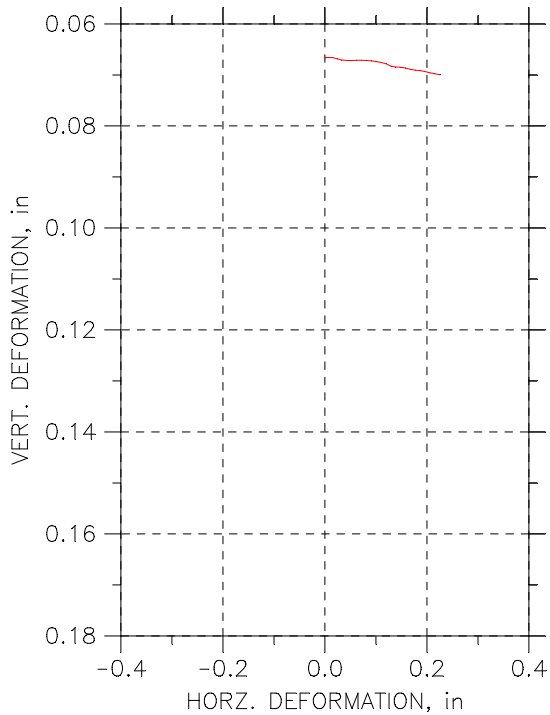
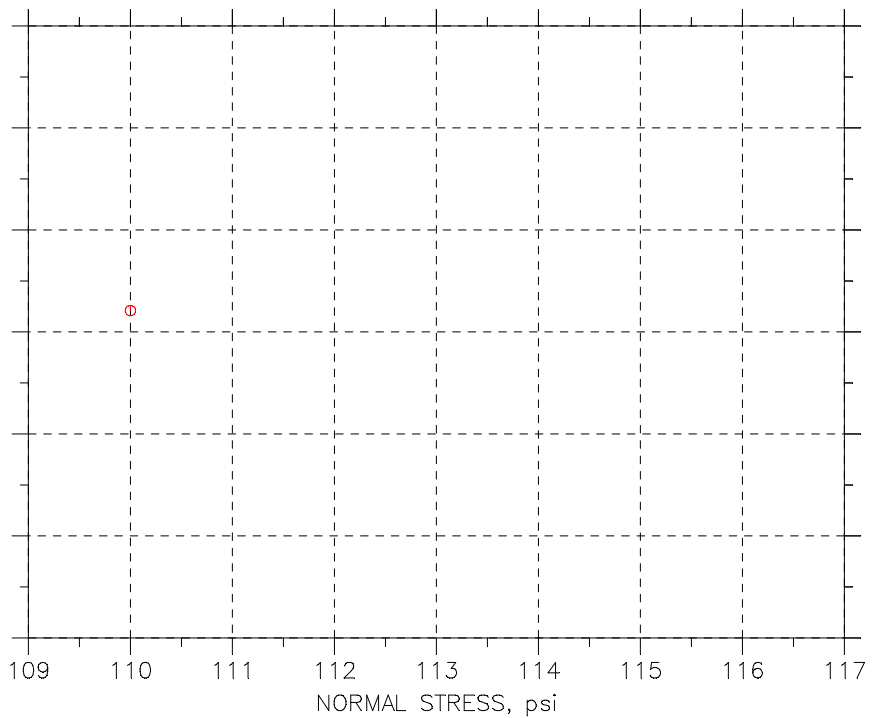
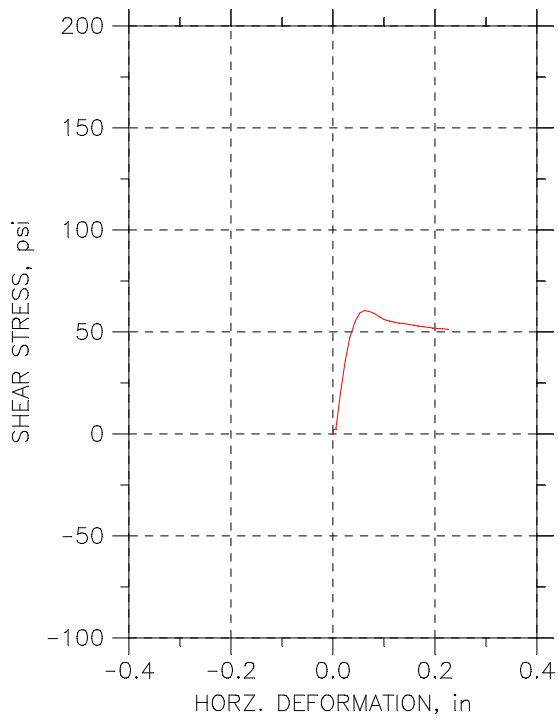
Step: 1 of 1

Stress: 110 psi



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 9/06/07	Depth: 63.5'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
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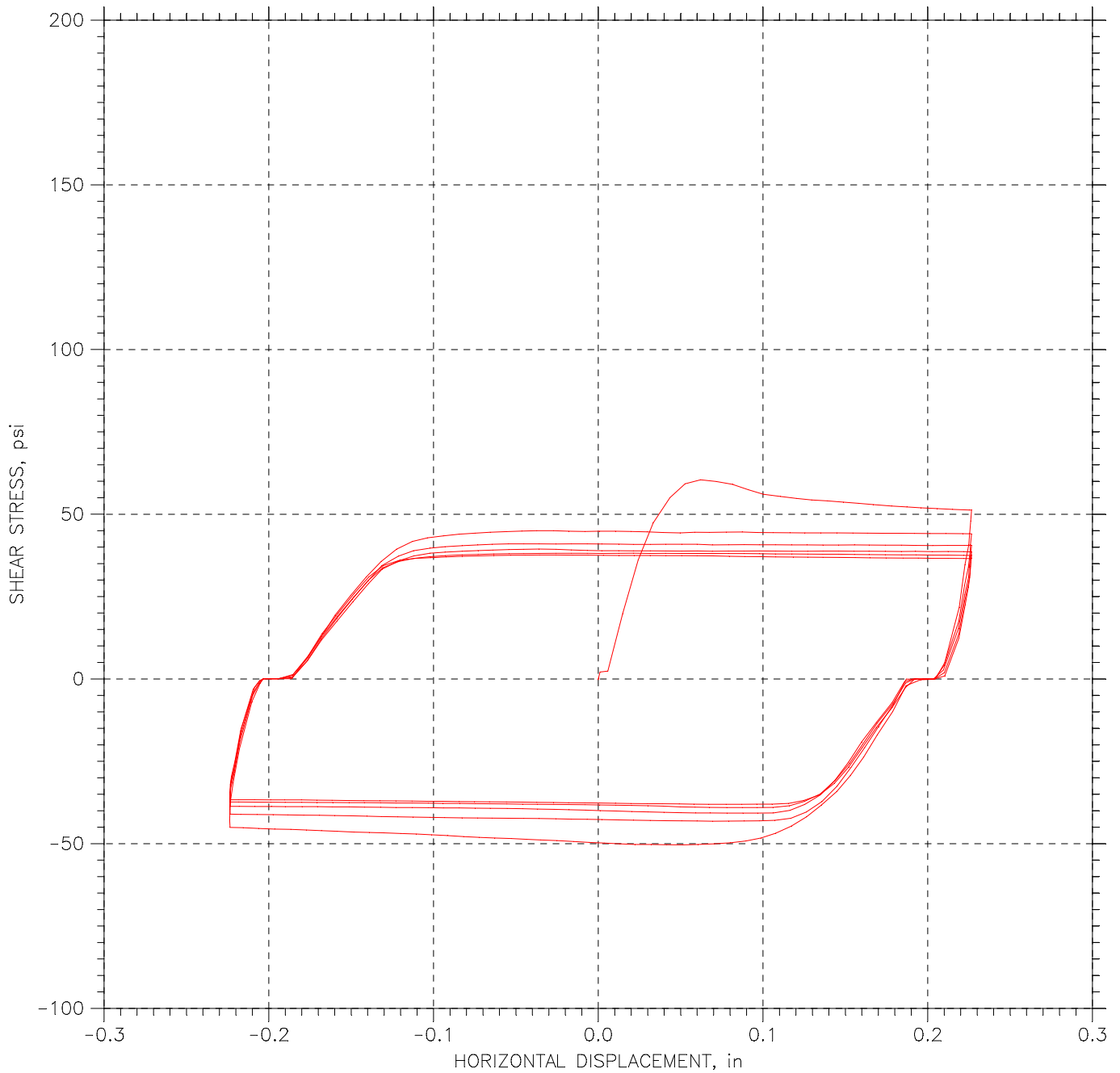
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-3			
Sample No.	P-3			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	27.54		
	Dry Density, pcf	104.5		
	Saturation, %	121.27		
	Void Ratio	0.61324		
Consol. Height, in		0.93341		
Consol. Void Ratio		0.50582		
Final	Water Content, %	19.42		
	Dry Density, pcf	127.4		
	Saturation, %	162.32		
	Void Ratio	0.32298		
Normal Stress, psi		110		
Max. Shear Stress, psi		60.459		
Res Shear Stress, psi		51.276		
Time to Failure, min		7.0035		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		53		
Plastic Limit		24		
Plasticity Index		29		

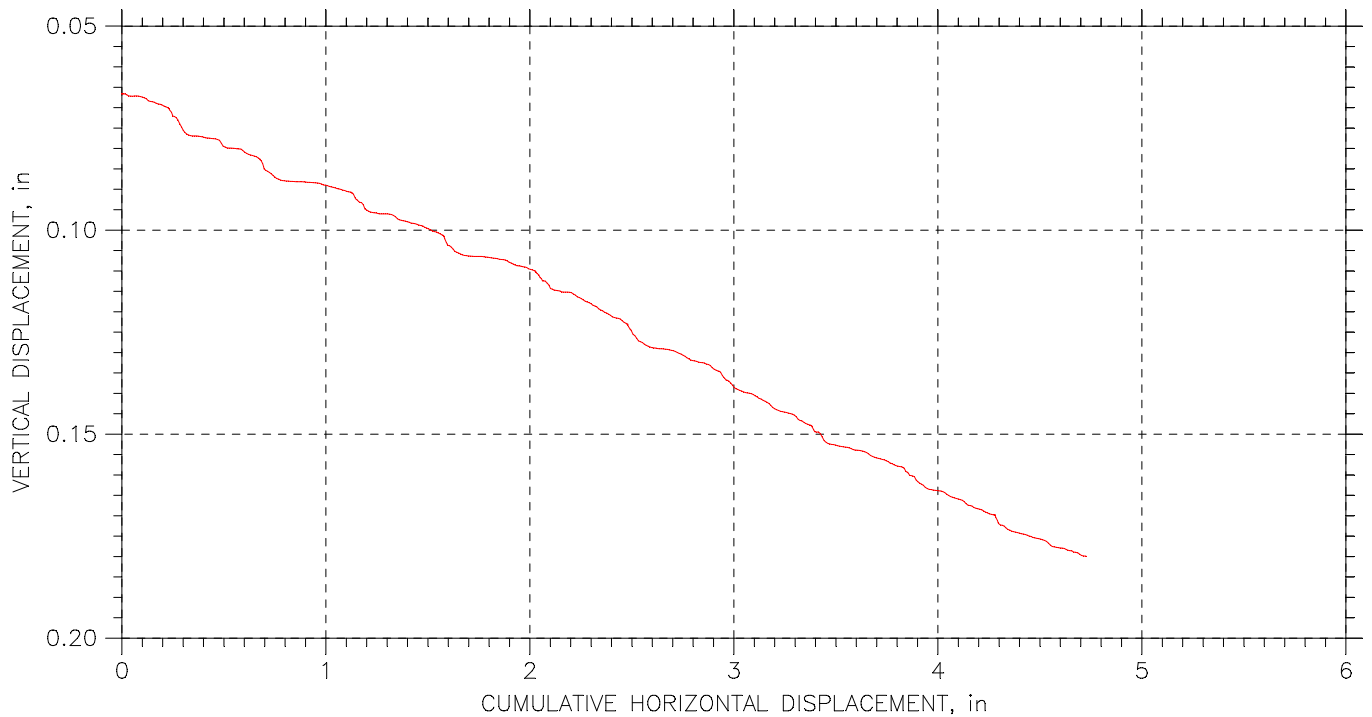
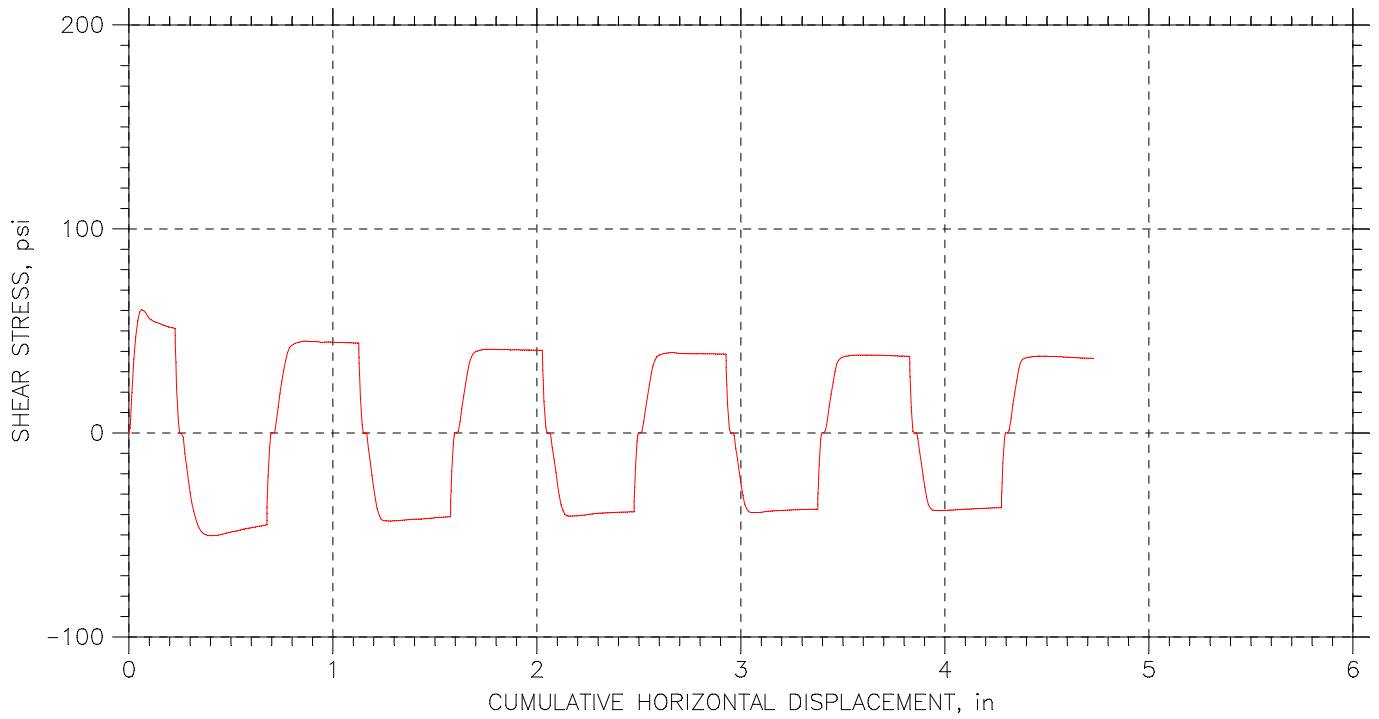
Project: Purple Line	
Location: College Park,MD	
Project No.: 14961	
Boring No.: CP-3A	
Sample Type: Pitcher	
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)	
Remarks: Constant Load (Sample allowed to swell prior to testing)	

RESIDUAL SHEAR TEST



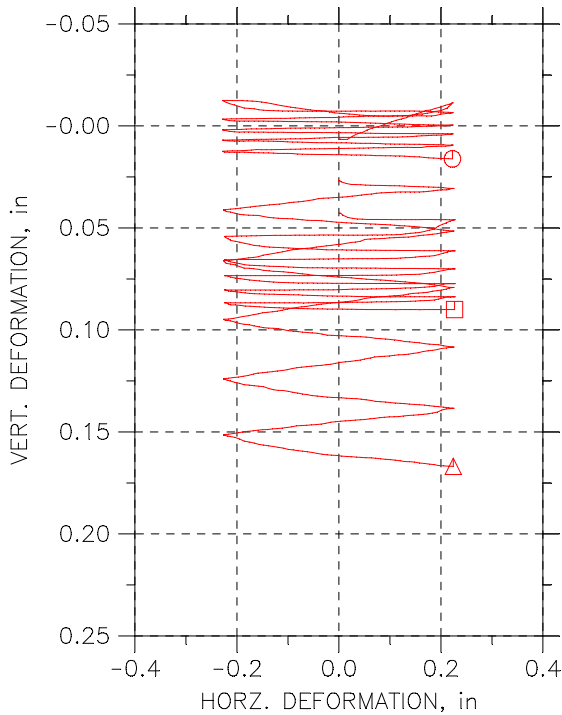
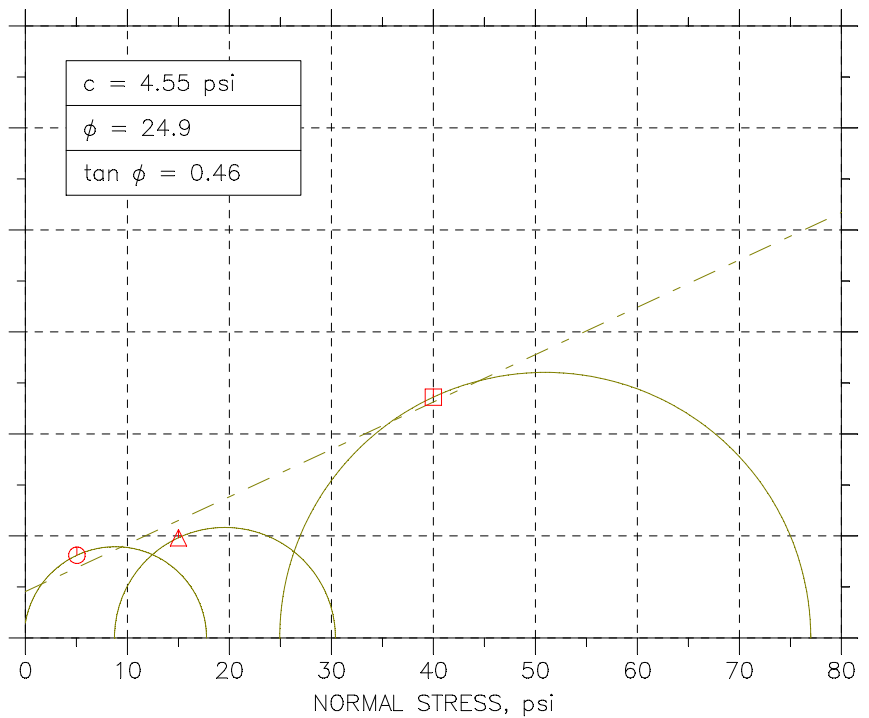
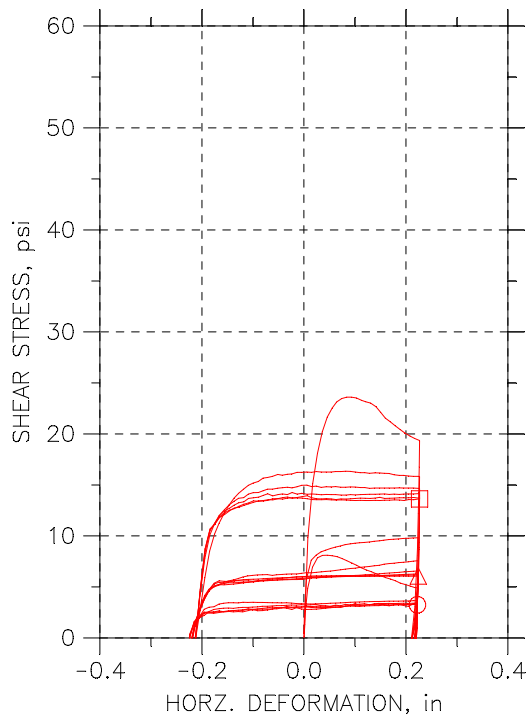
Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 9/06/07	Depth: 63.5'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-3 P-3 110PSI cons		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park,MD	Project No.: 14961
Boring No.: CP-3A	Tested By: Gladys A	Checked By: Bert
Sample No.: P-3	Test Date: 9/06/07	Depth: 63.5'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Dark Gray Moist Stiff slickensided Clay with silt and fine Sand lenses (CH)		
Remarks: Constant Load (Sample allowed to swell prior to testing)		
File: C:\Geocomp\PROJECTS\14961-0 Purple Line MTA\residual direct shear\August 2007\residual shear CP-3 P-3 110PSI cons		

DIRECT SHEAR TEST REPORT



Symbol	⊙	△	□	
Test No.	A-1	A-2	A-3	
Sample No.	P-1	P-1	P-1	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	26.86	33.75	27.98
	Dry Density, pcf	100.49	92.161	98.851
	Saturation, %	107.07	109.92	107.13
	Void Ratio	0.67728	0.82892	0.70514
Consol. Height, in		0.99328	0.97318	0.95734
Consol. Void Ratio		0.66602	0.77986	0.6324
Final	Water Content, %	28.09	33.05	24.25
	Dry Density, pcf	102.14	110.62	108.63
	Saturation, %	116.64	170.41	118.70
	Void Ratio	0.65019	0.52367	0.5517
Normal Stress, psi		5.0505	14.999	39.997
Max. Shear Stress, psi		8.1071	9.8212	23.609
Shear Stress, psi		3.2461	6.0617	13.622
Time to Failure, min		5.0037	24.061	10.003
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		50	50	50
Plastic Limit		24	24	24
Plasticity Index		26	26	26

Project: Purple Line

Location: College Park, MD

Project No.: 14961

Boring No.: CP-4A

Sample Type: Pitcher

Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)

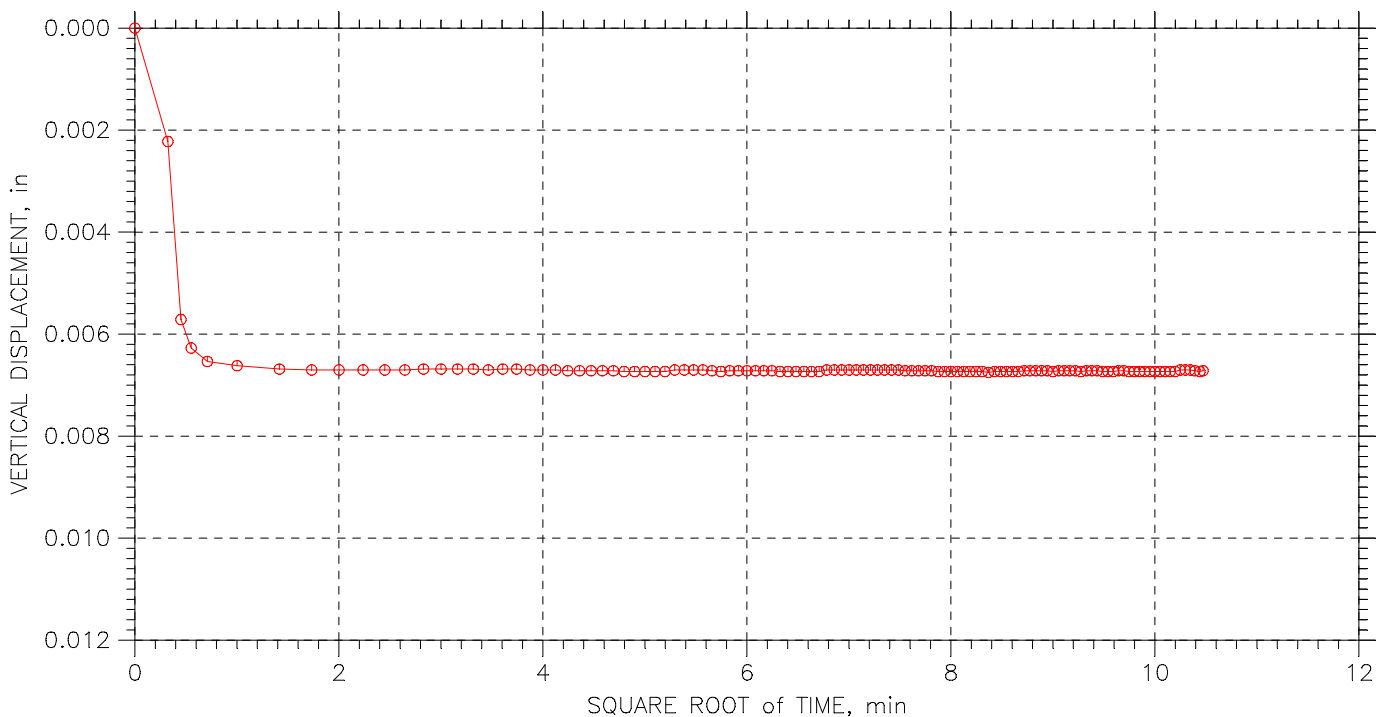
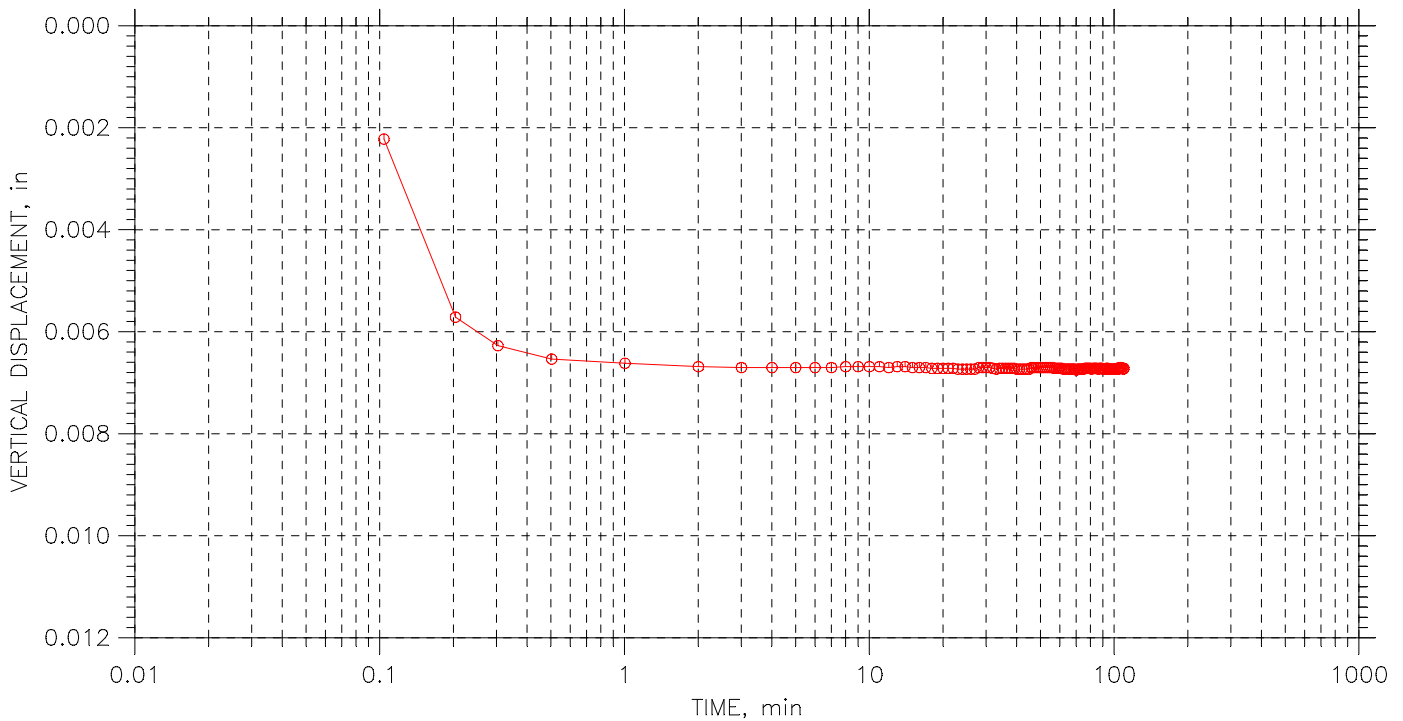
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

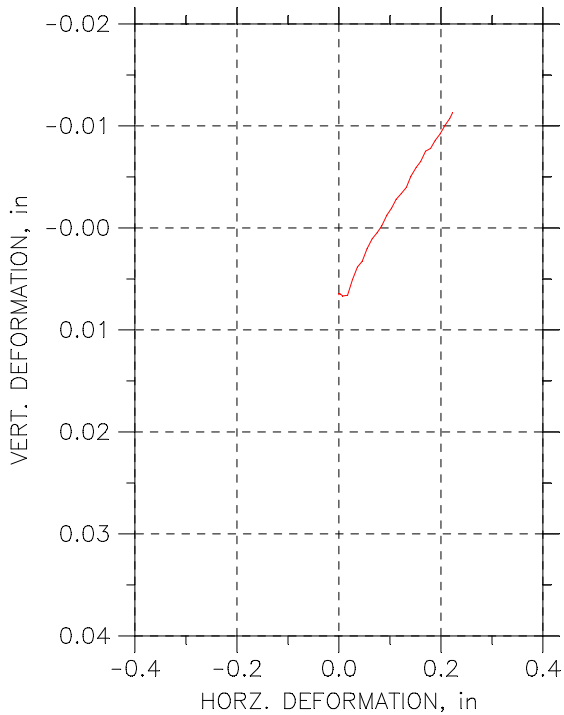
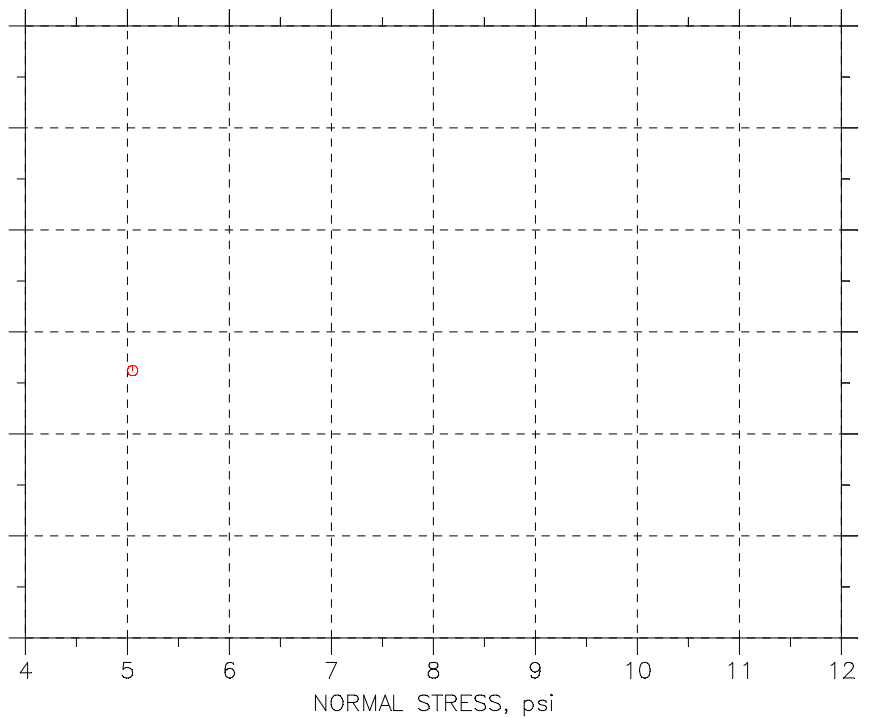
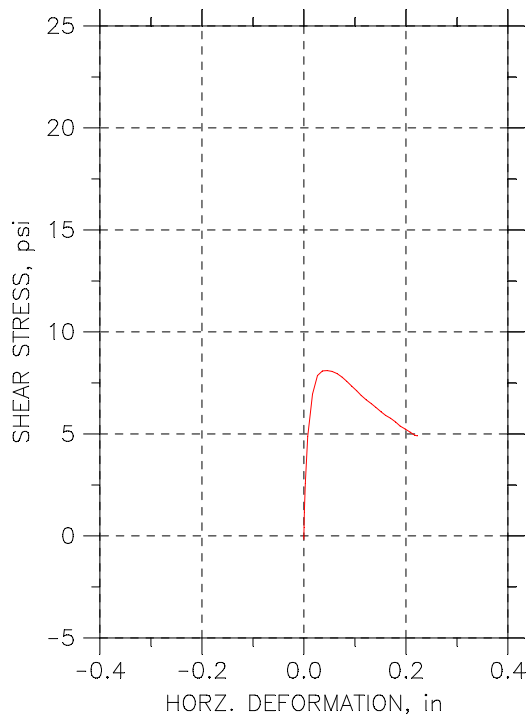
Step: 1 of 1

Stress: 5 psi



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/20/07	Depth: 17.8'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
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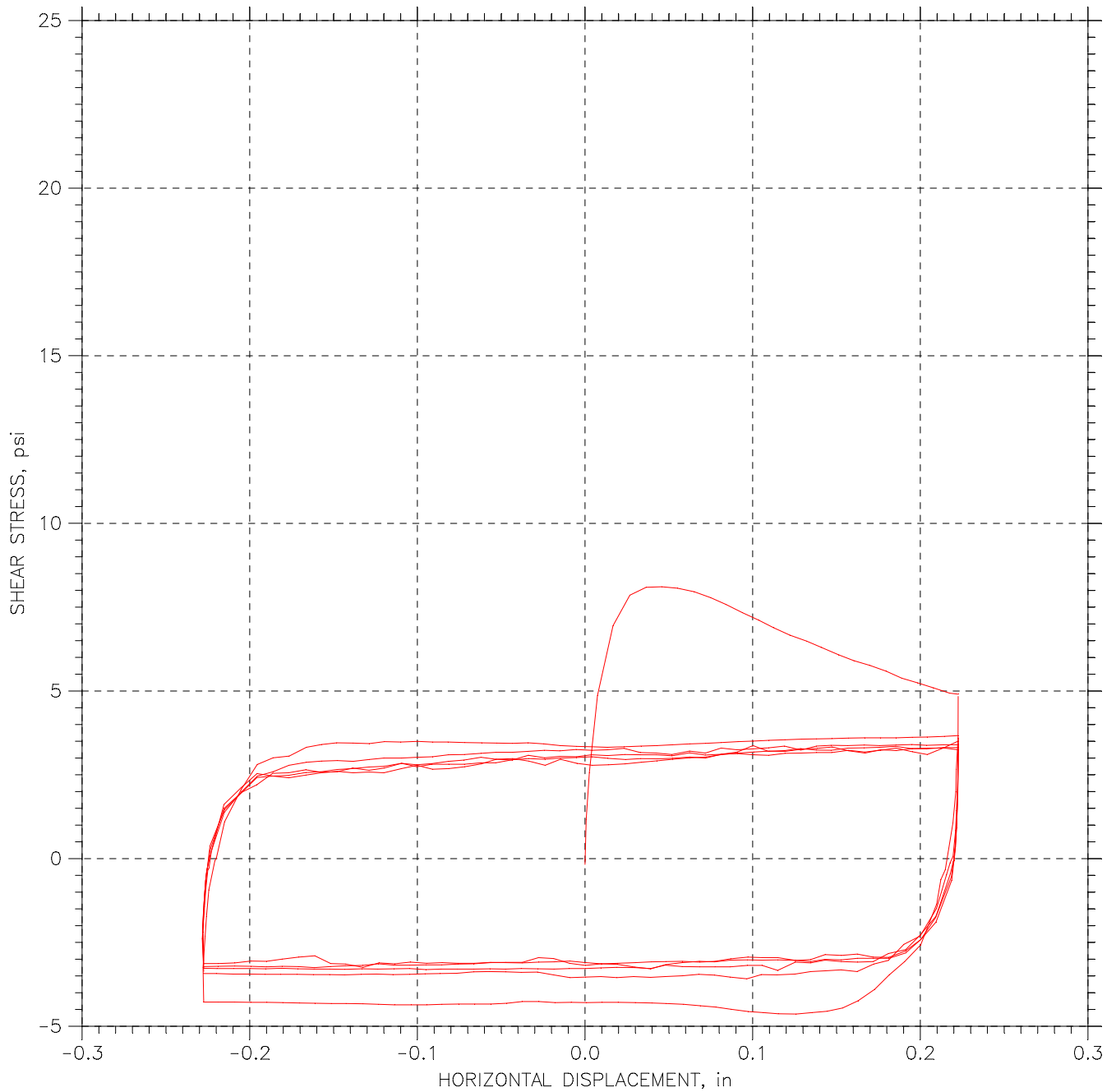
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-1			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	26.86		
	Dry Density, pcf	100.5		
	Saturation, %	107.07		
	Void Ratio	0.67728		
Consol. Height, in		0.99328		
Consol. Void Ratio		0.66602		
Final	Water Content, %	28.09		
	Dry Density, pcf	102.1		
	Saturation, %	116.64		
	Void Ratio	0.65019		
Normal Stress, psi		5.0505		
Max. Shear Stress, psi		8.1071		
Ult. Shear Stress, psi		4.9023		
Time to Failure, min		5.0037		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		24		
Plasticity Index		26		

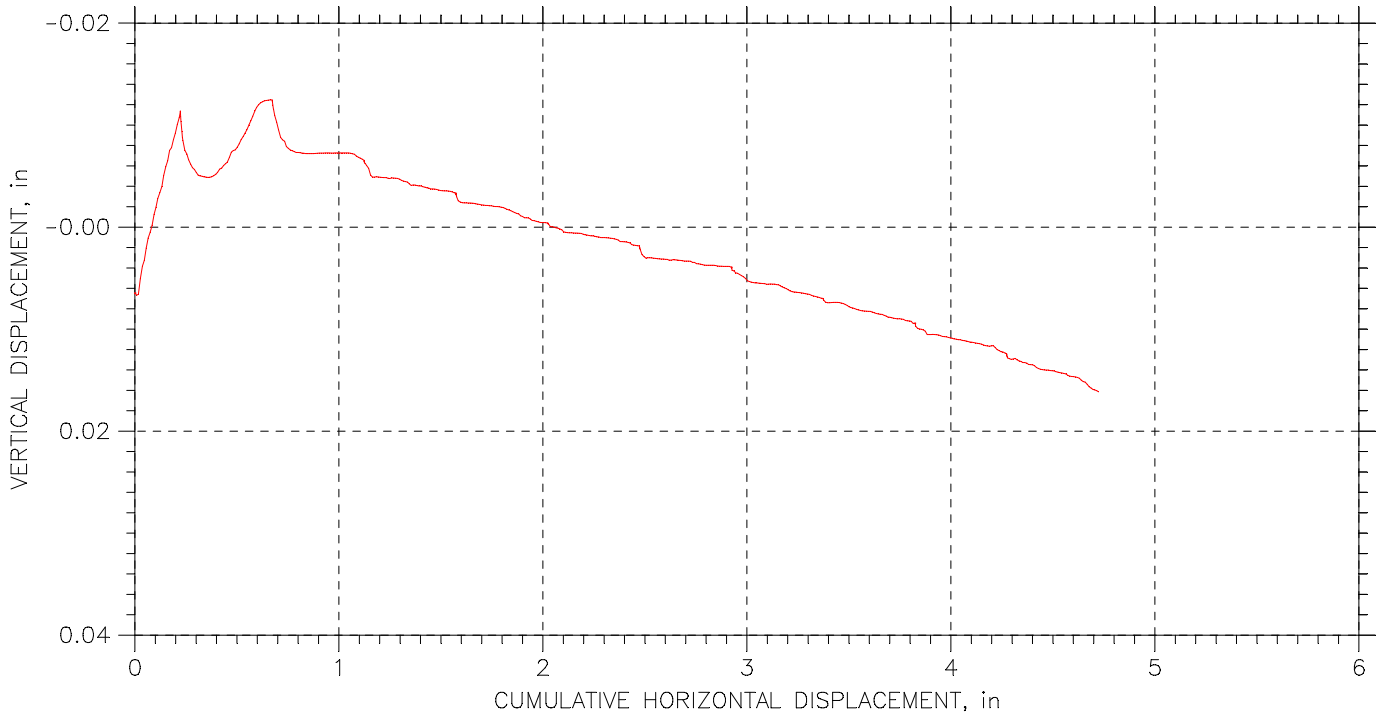
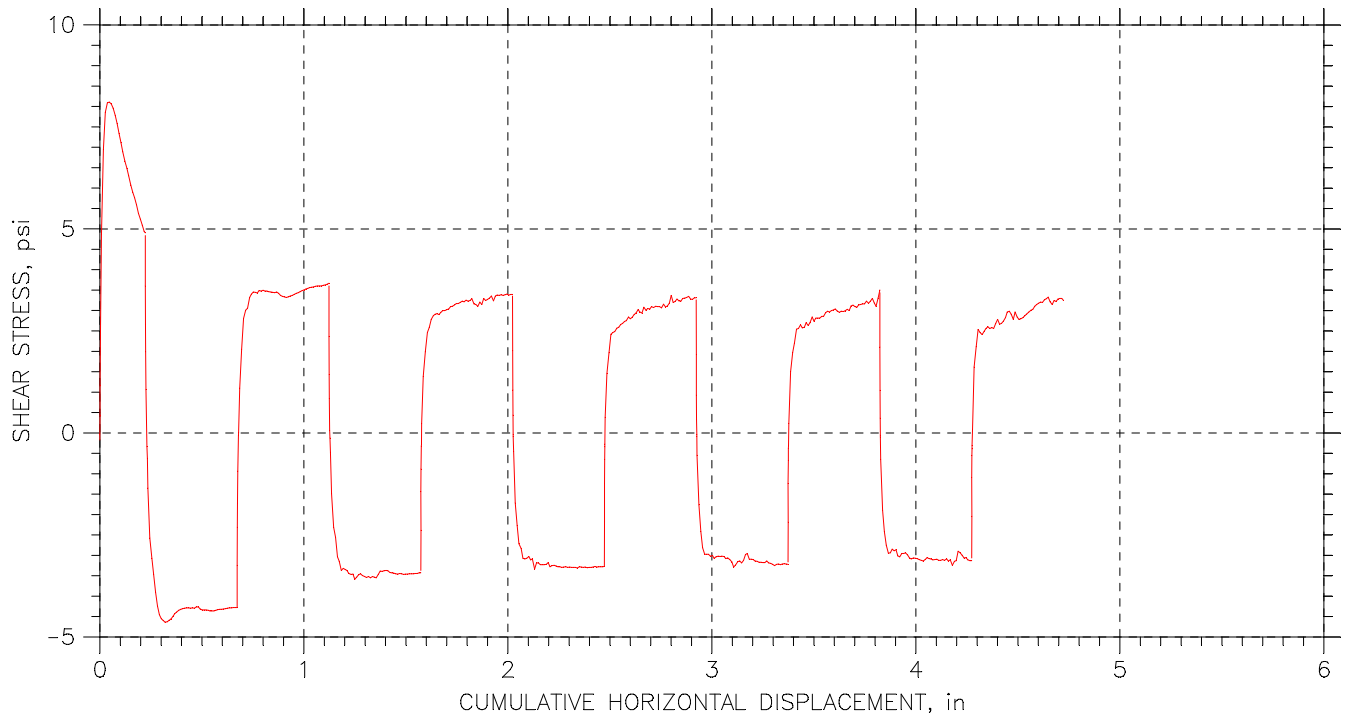
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-4A	
Sample Type: Pitcher	
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)	
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/20/07	Depth: 17.8'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
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RESIDUAL SHEAR TEST



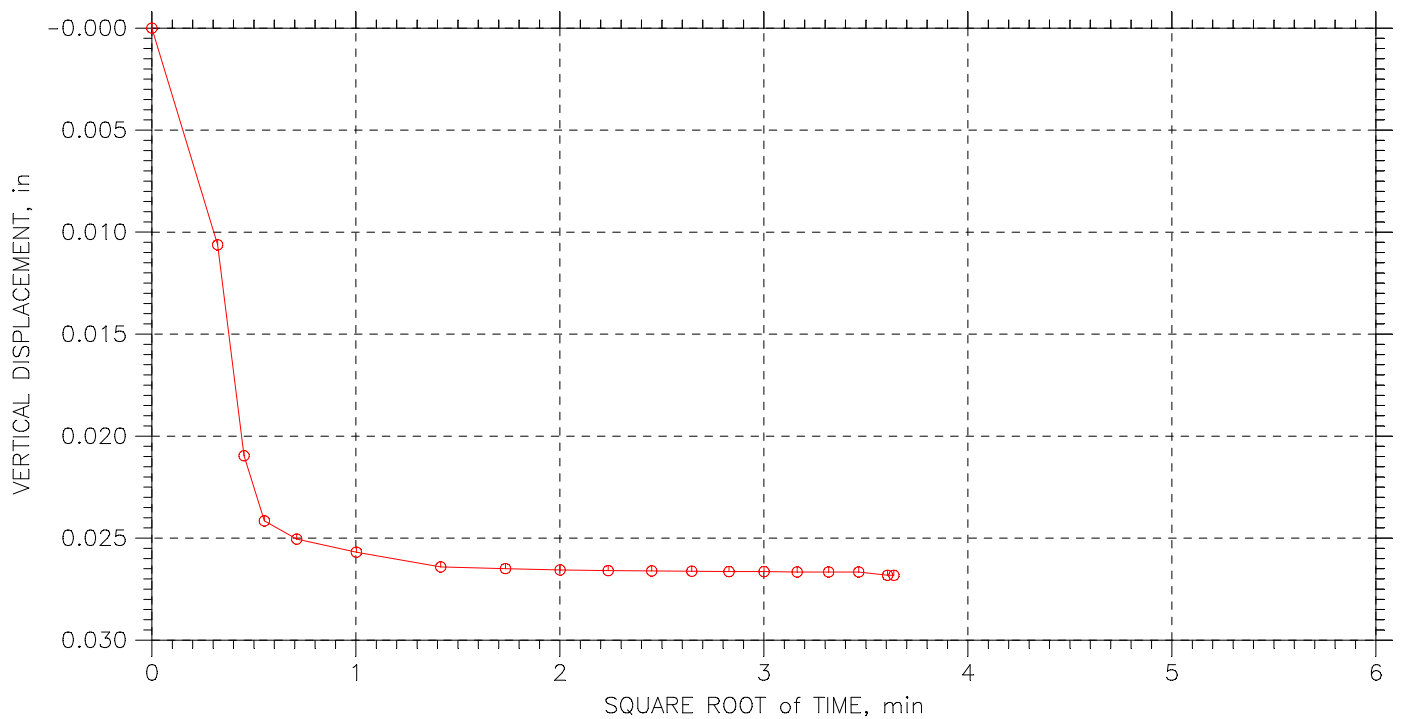
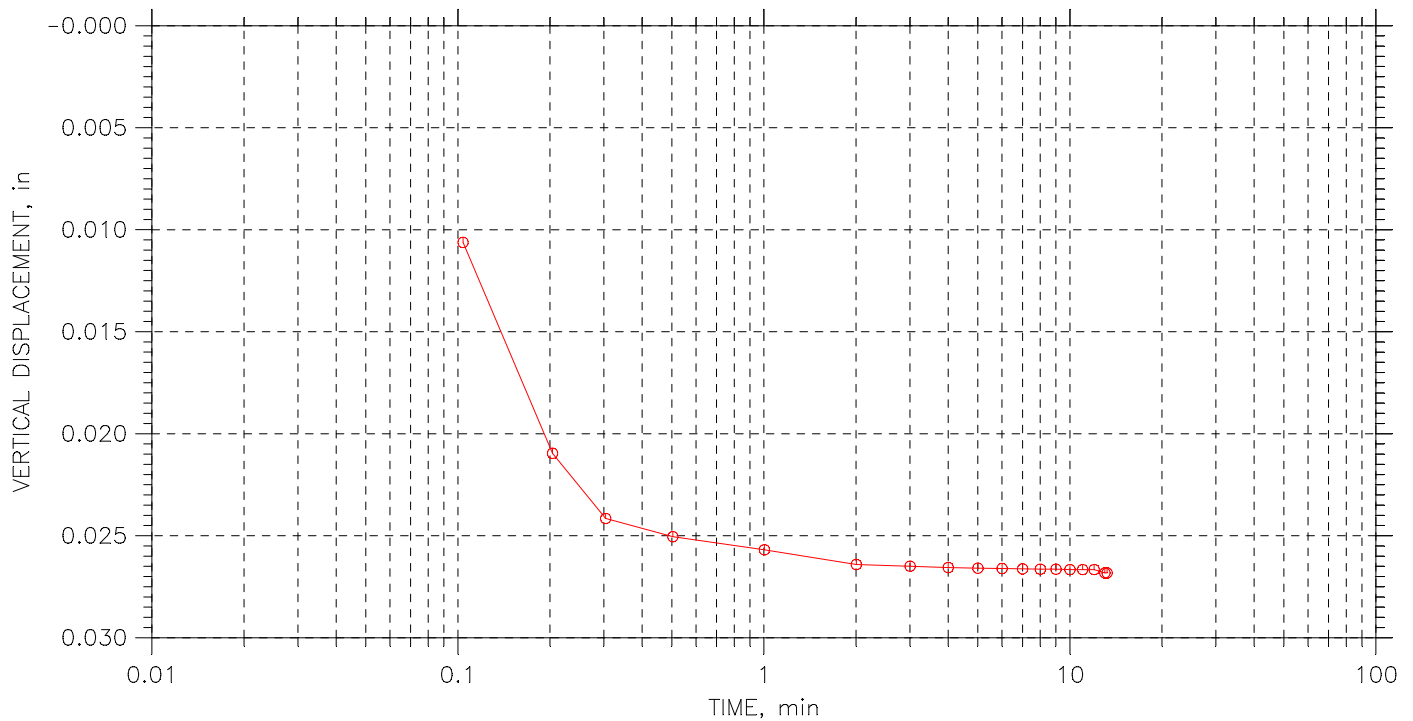
Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/20/07	Depth: 17.8'
Test No.: A-1	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

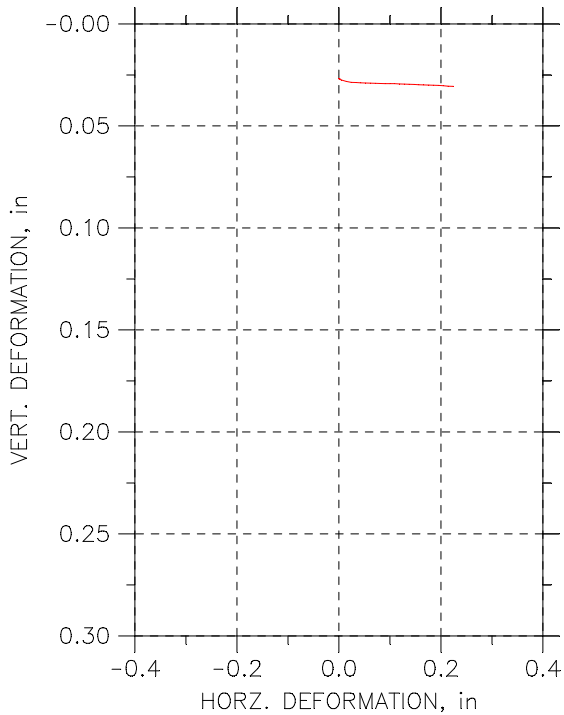
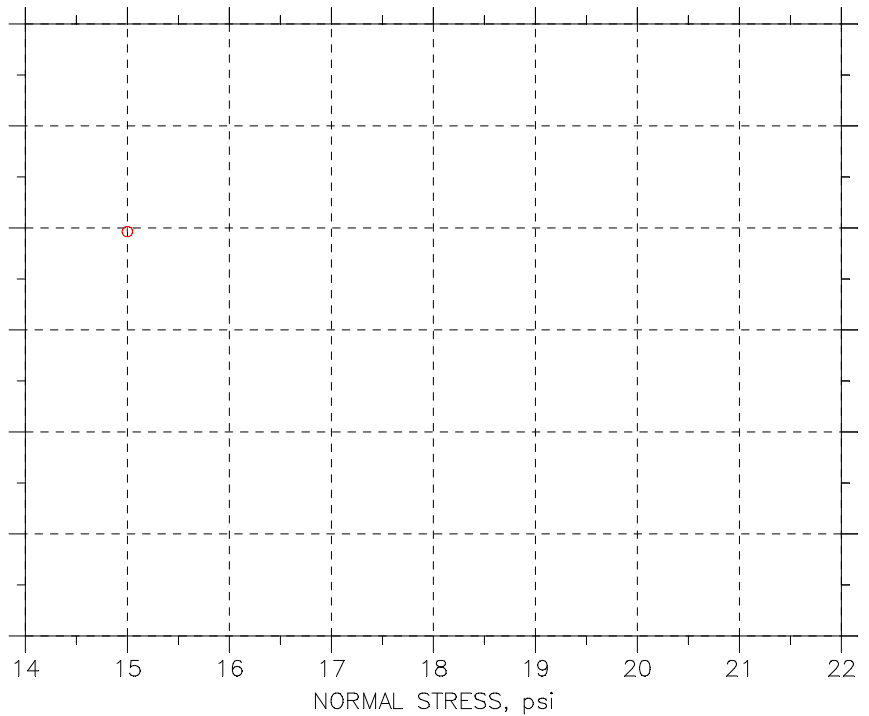
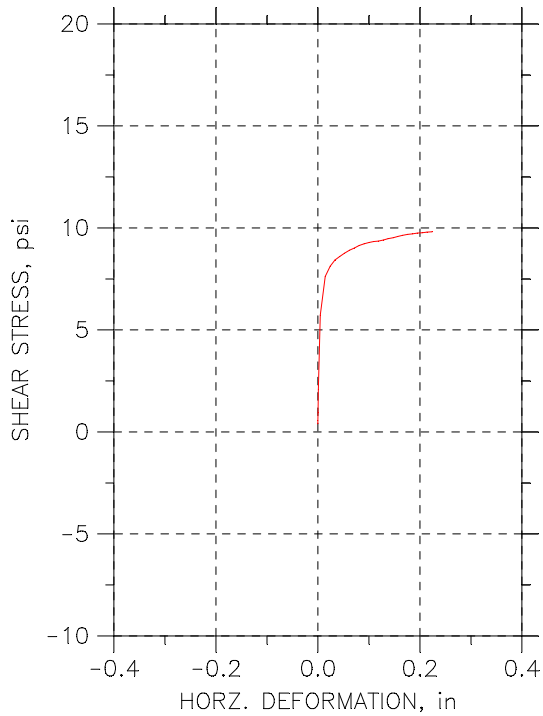
Step: 1 of 1

Stress: 15 psi



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/18/07	Depth: 18.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

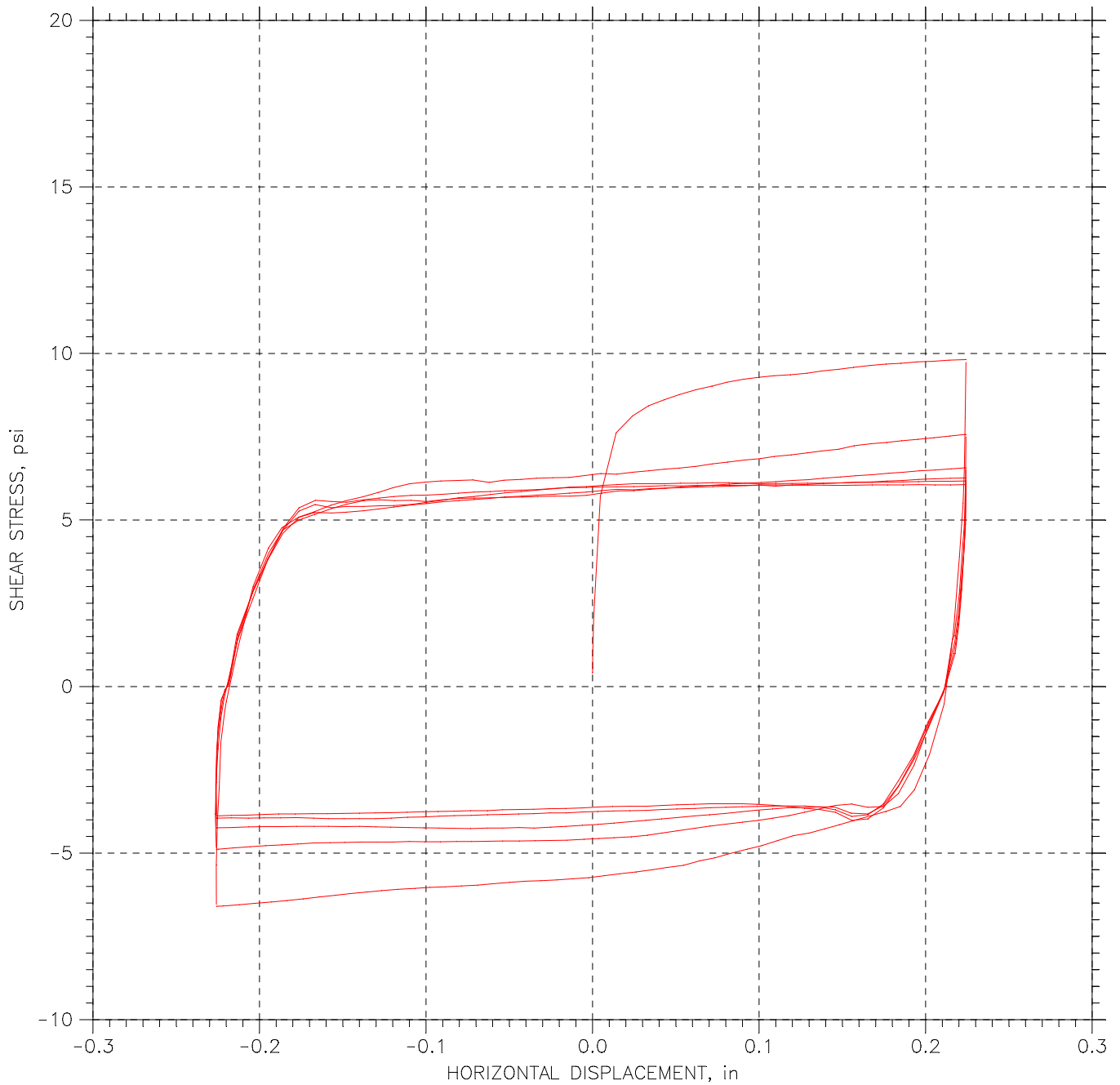
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	A-2			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	33.75		
	Dry Density, pcf	92.16		
	Saturation, %	109.92		
	Void Ratio	0.82892		
Consol. Height, in		0.97318		
Consol. Void Ratio		0.77986		
Final	Water Content, %	33.05		
	Dry Density, pcf	110.6		
	Saturation, %	170.41		
	Void Ratio	0.52367		
Normal Stress, psi		14.999		
Max. Shear Stress, psi		9.8212		
Ult. Shear Stress, psi		9.8212		
Time to Failure, min		24.061		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		24		
Plasticity Index		26		

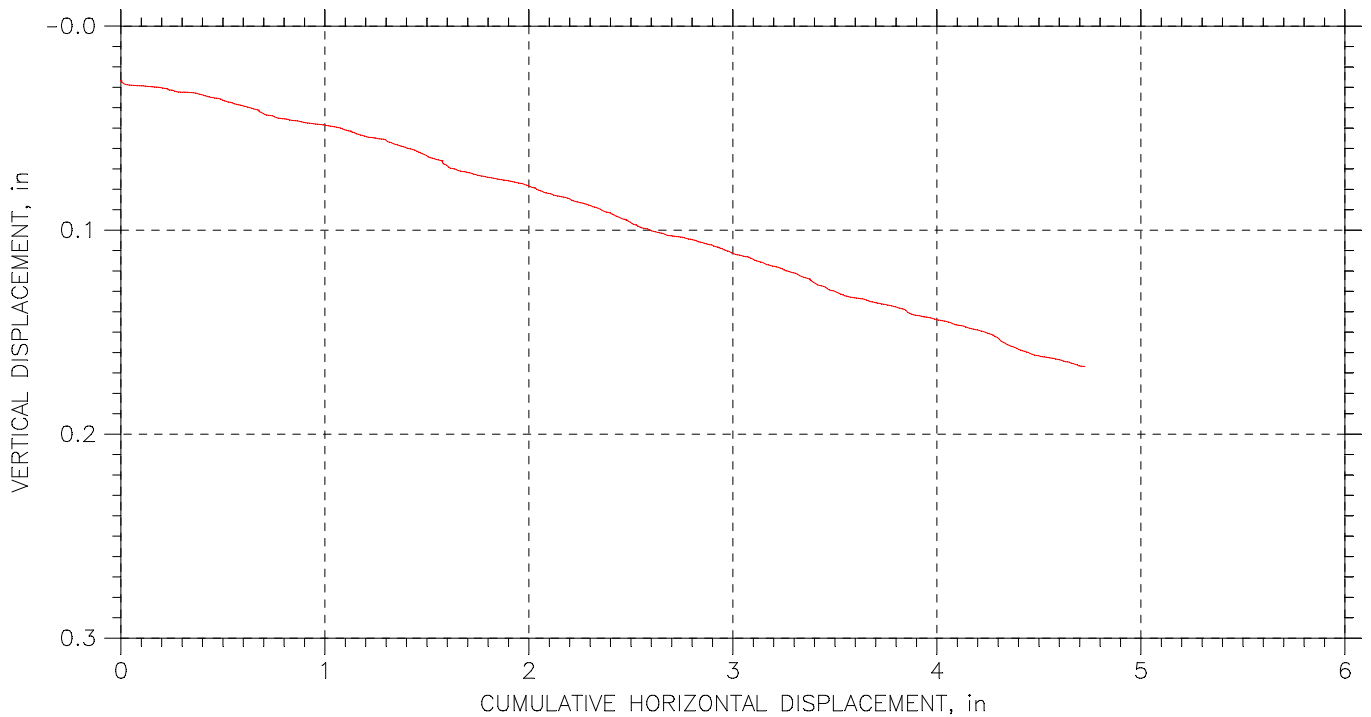
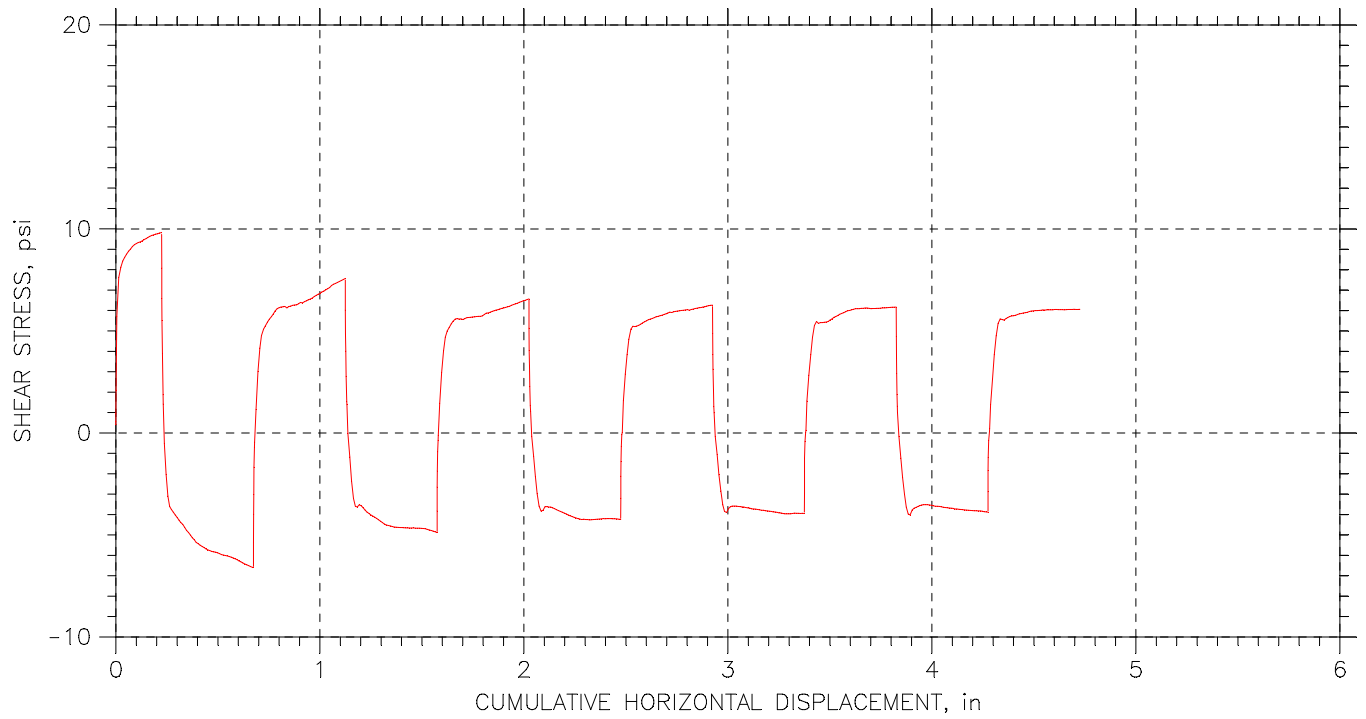
Project: Purple Line	
Location: College Park, MD	
Project No.: 14961	
Boring No.: CP-4A	
Sample Type: Pitcher	
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)	
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/18/07	Depth: 18.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

RESIDUAL SHEAR TEST



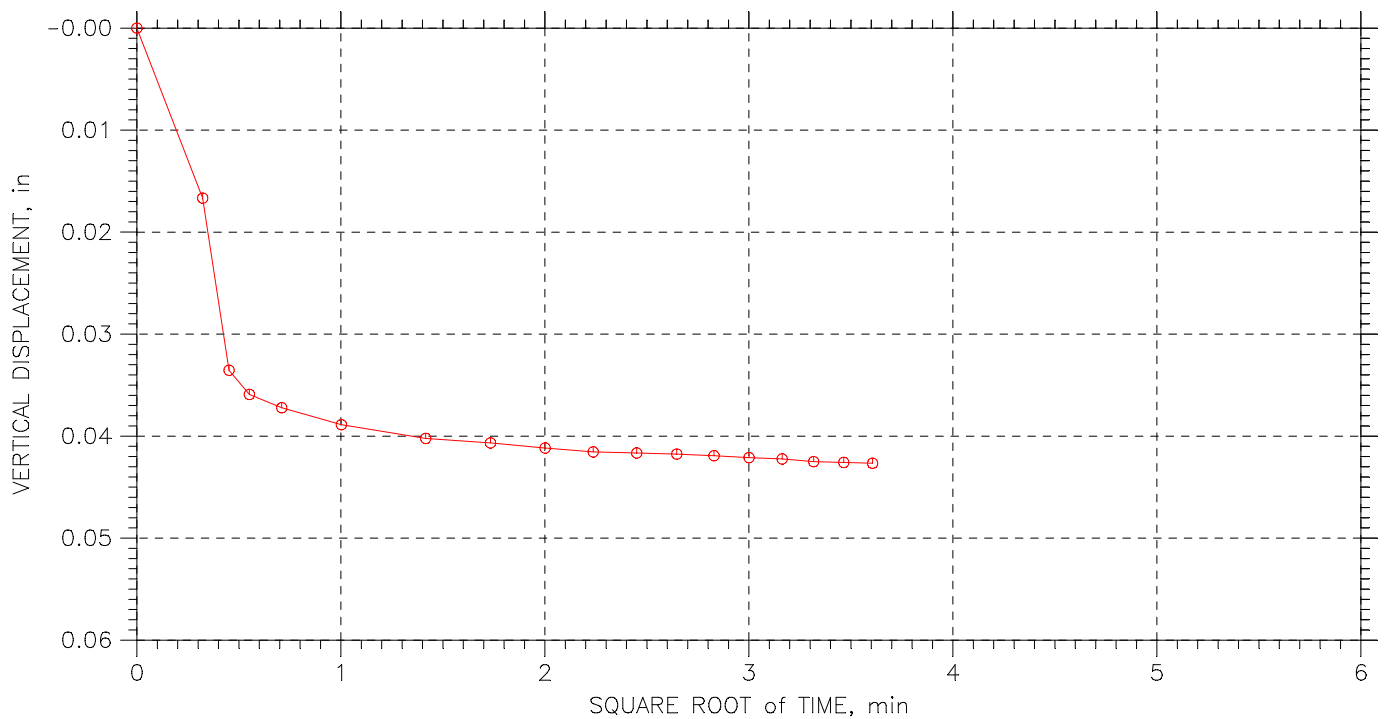
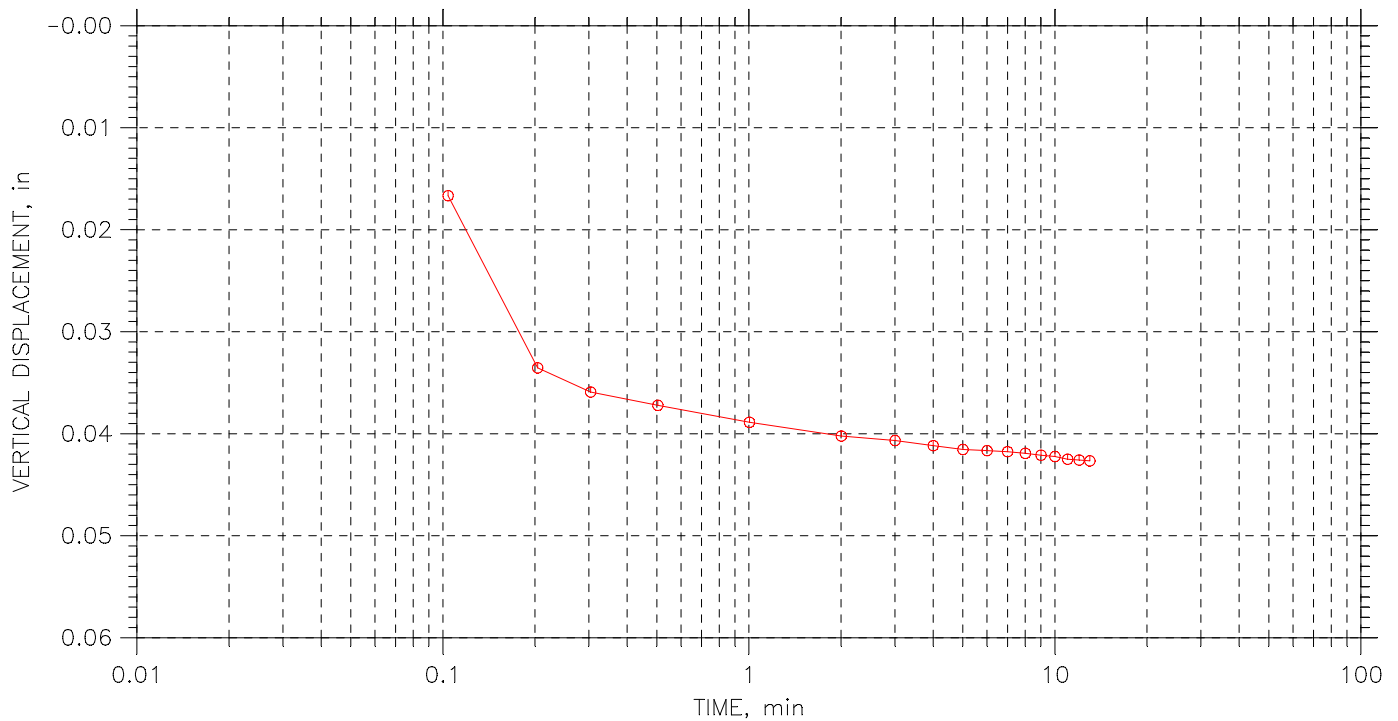
Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/18/07	Depth: 18.0'
Test No.: A-2	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

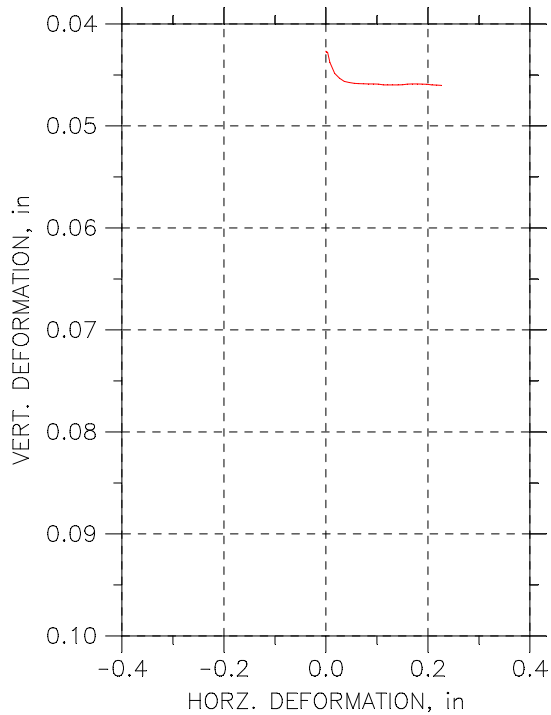
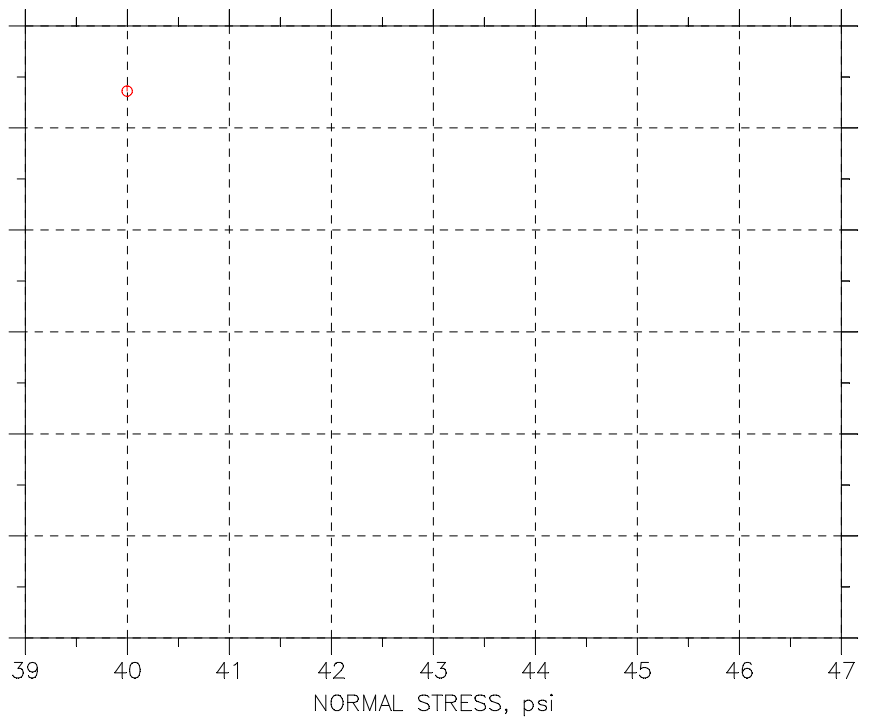
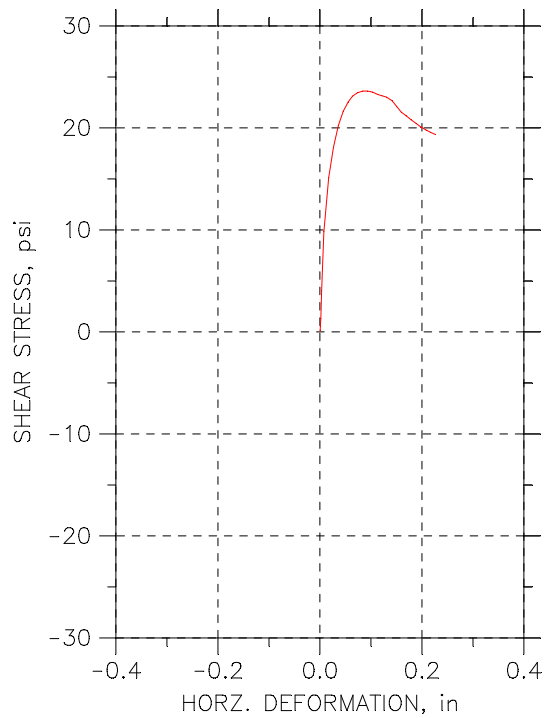
Step: 1 of 1

Stress: 40 psi



Project: Purple Line	Location: College Park. MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/18/07	Depth: 18.2'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST REPORT

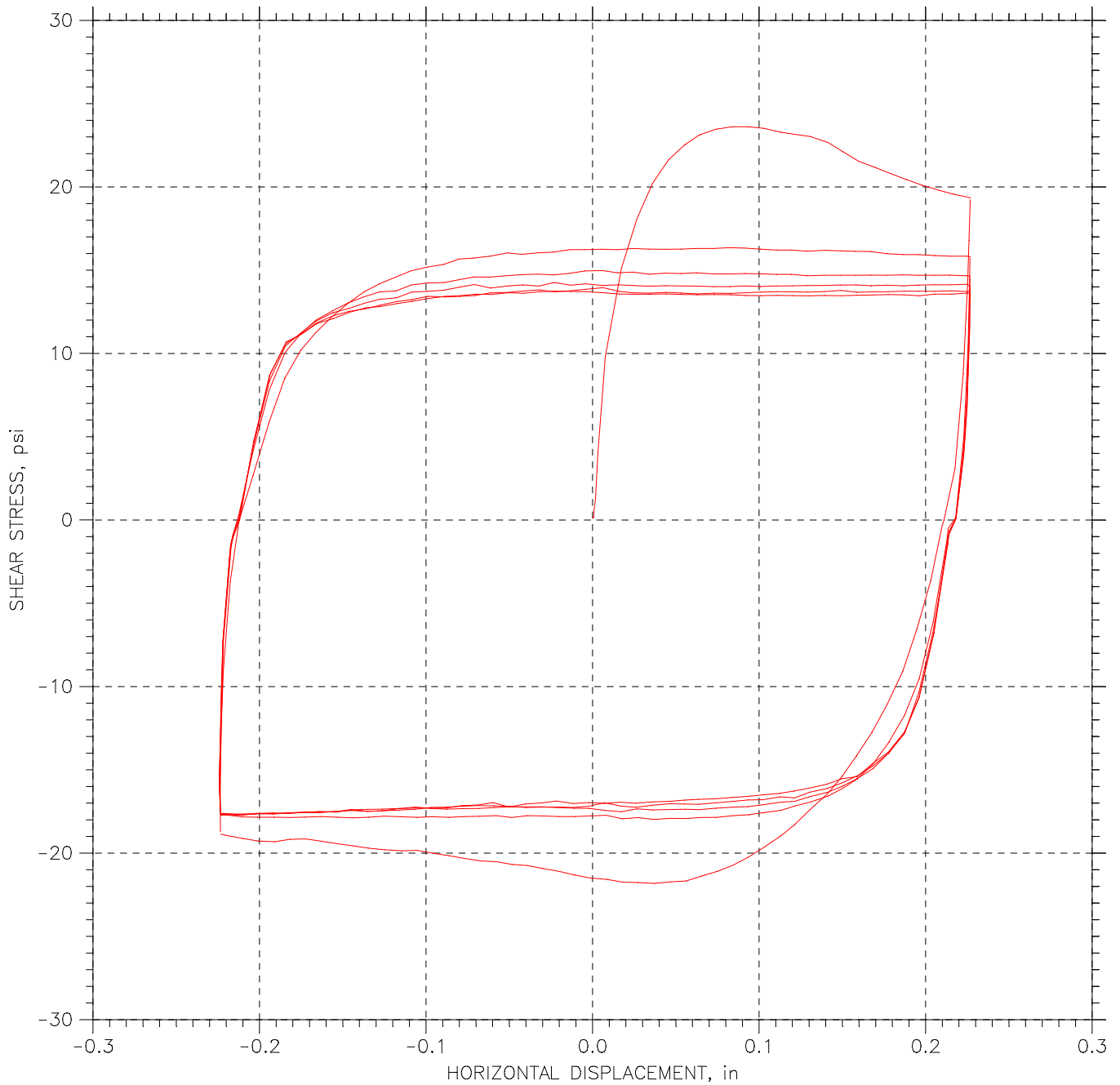


Symbol				
Test No.	A-3			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	27.98		
	Dry Density, pcf	98.85		
	Saturation, %	107.13		
	Void Ratio	0.70514		
Consol. Height, in		0.95734		
Consol. Void Ratio		0.6324		
Final	Water Content, %	24.25		
	Dry Density, pcf	108.6		
	Saturation, %	118.70		
	Void Ratio	0.5517		
Normal Stress, psi		39.997		
Max. Shear Stress, psi		23.609		
Ult. Shear Stress, psi		19.353		
Time to Failure, min		9.0035		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		24		
Plasticity Index		26		

Project: Purple Line
 Location: College Park. MD
 Project No.: 14961
 Boring No.: CP-4A
 Sample Type: Pitcher

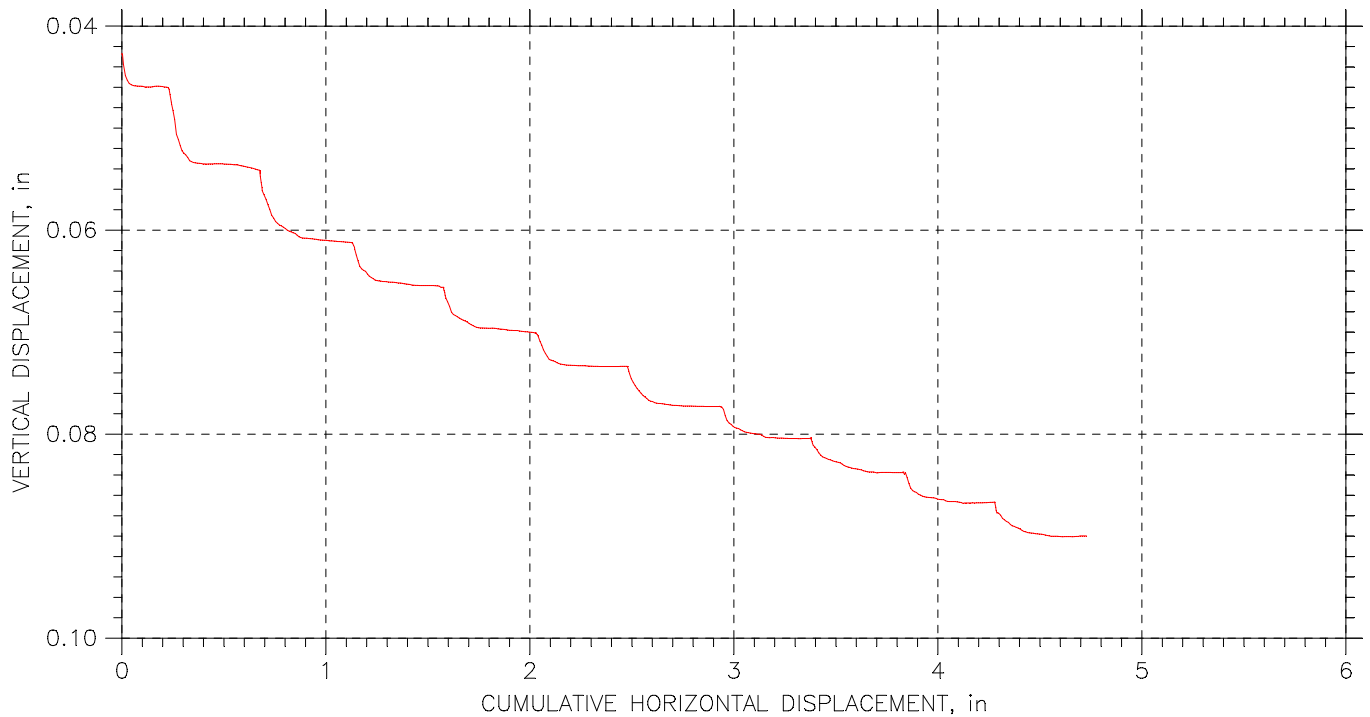
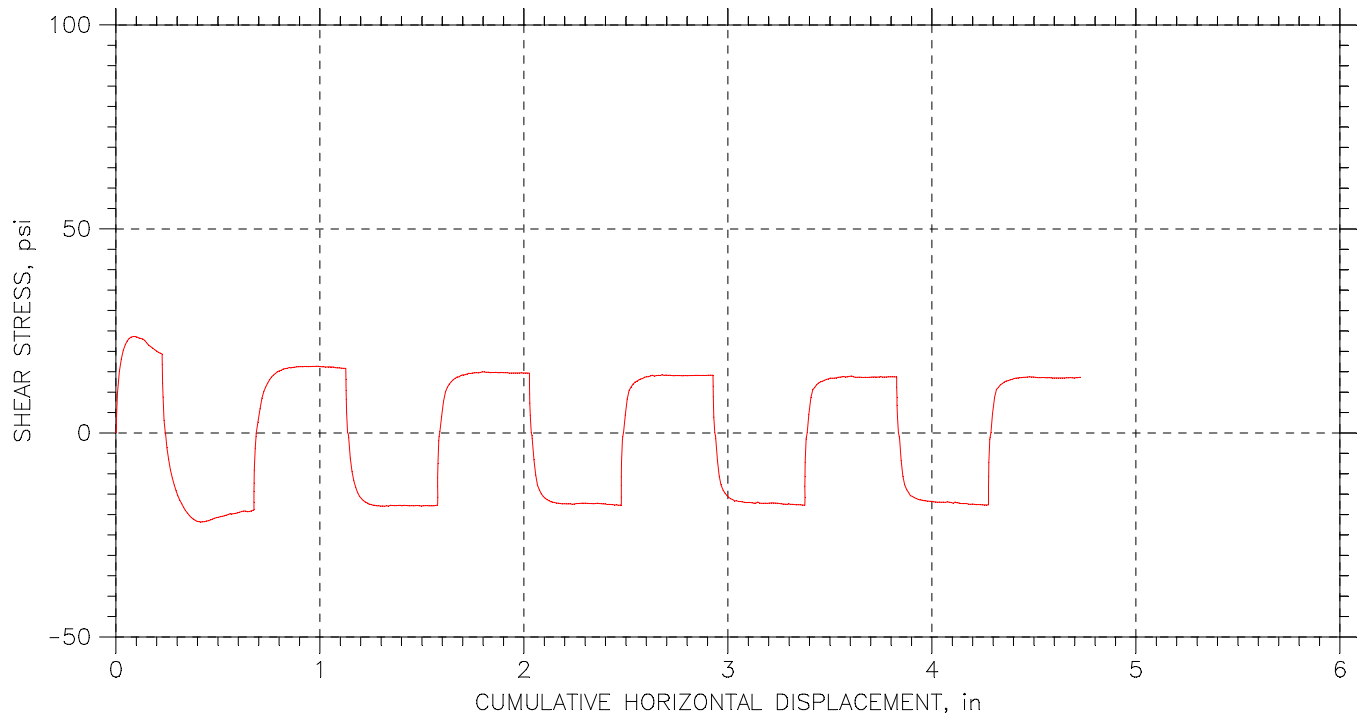
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)
 Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)

RESIDUAL SHEAR TEST



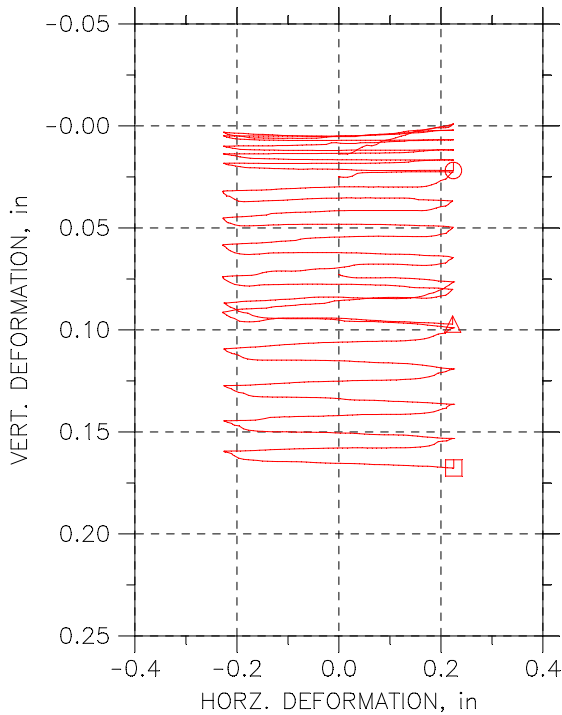
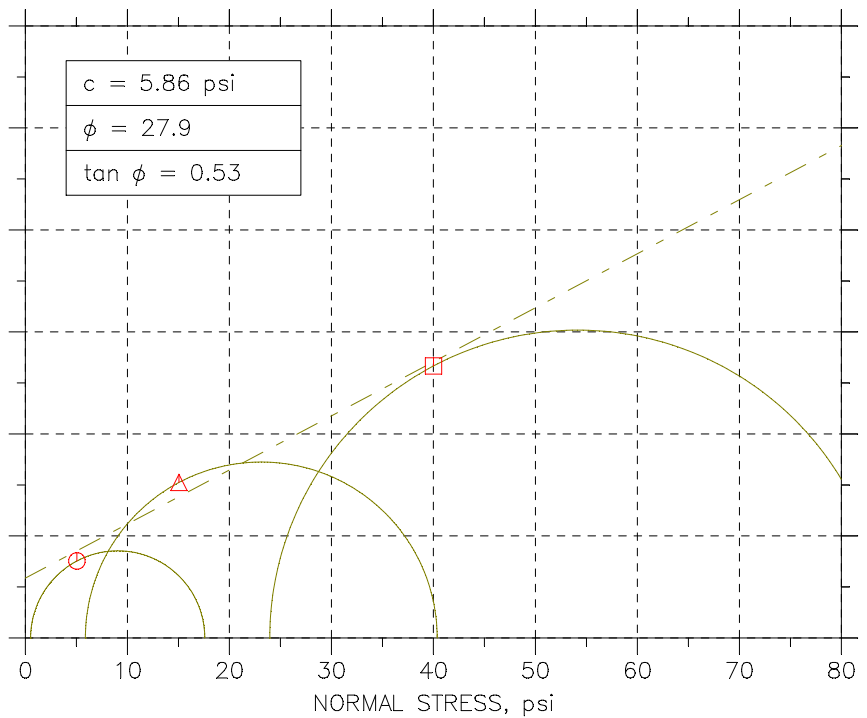
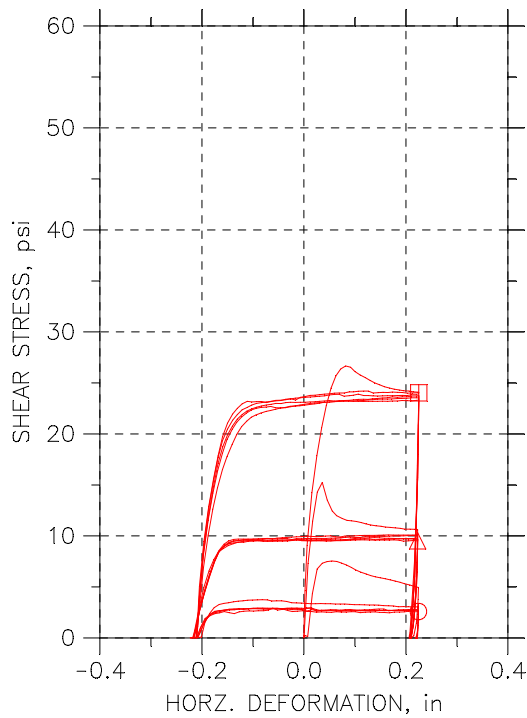
Project: Purple Line	Location: College Park. MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/18/07	Depth: 18.2'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park. MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/18/07	Depth: 18.2'
Test No.: A-3	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Volume (Sample not allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST REPORT



Symbol	⊖	Δ	⊠	
Test No.	B-1	B-2	B-3	
Sample No.	P-1	P-1	P-1	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	27.21	21.73	23.36
	Dry Density, pcf	100.64	106.01	105.8
	Saturation, %	108.86	99.45	106.36
	Void Ratio	0.67486	0.59001	0.59309
Consol. Height, in		0.98653	0.97532	0.92765
Consol. Void Ratio		0.6523	0.55076	0.47783
Final	Water Content, %	26.43	19.63	19.73
	Dry Density, pcf	102.89	117.41	127.12
	Saturation, %	111.81	121.70	163.39
	Void Ratio	0.63827	0.43559	0.32597
Normal Stress, psi		5.0505	15.05	40.005
Max. Shear Stress, psi		7.544	15.237	26.665
Shear Stress, psi		2.5919	9.5231	24.031
Time to Failure, min		6.0036	5.0037	9.0033
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		50	50	50
Plastic Limit		24	24	24
Plasticity Index		26	26	26

Project: Purple Line

Location: College Park, MD

Project No.: 14961

Boring No.: CP-4A

Sample Type: Pitcher

Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)

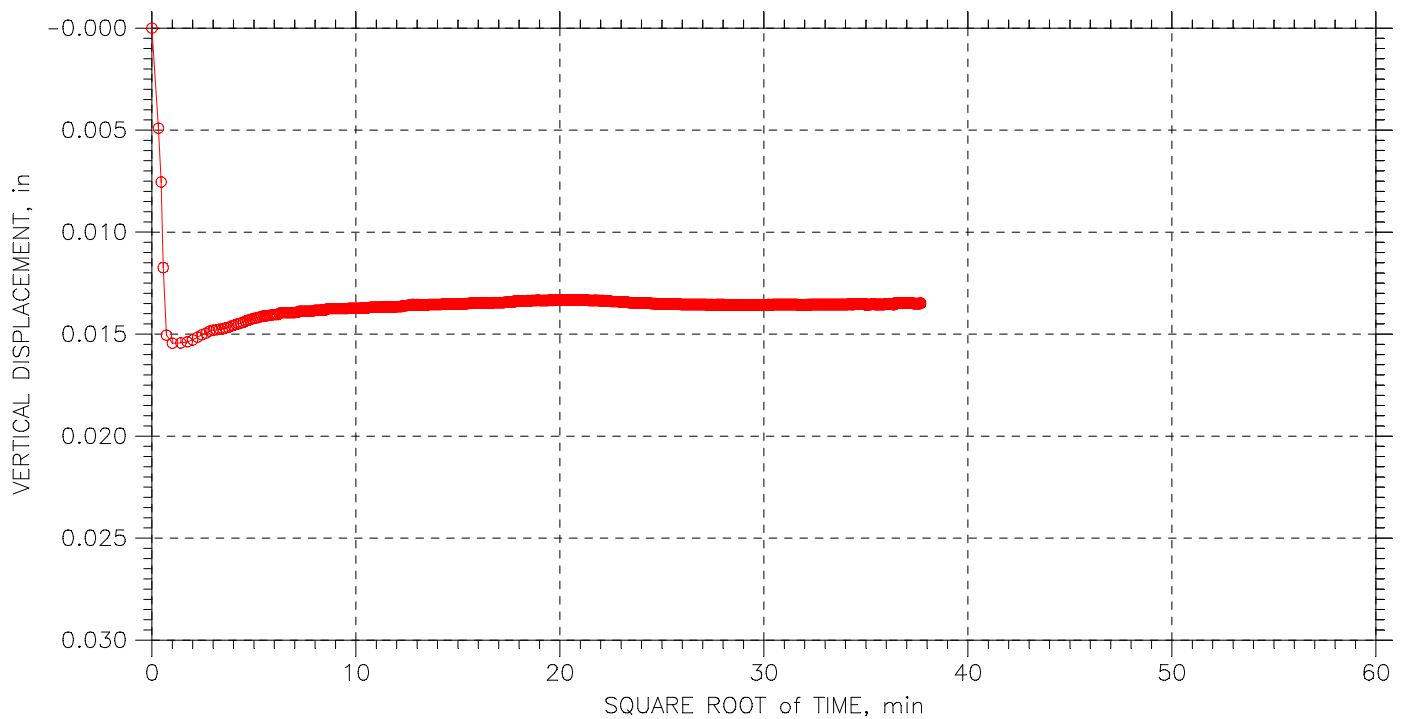
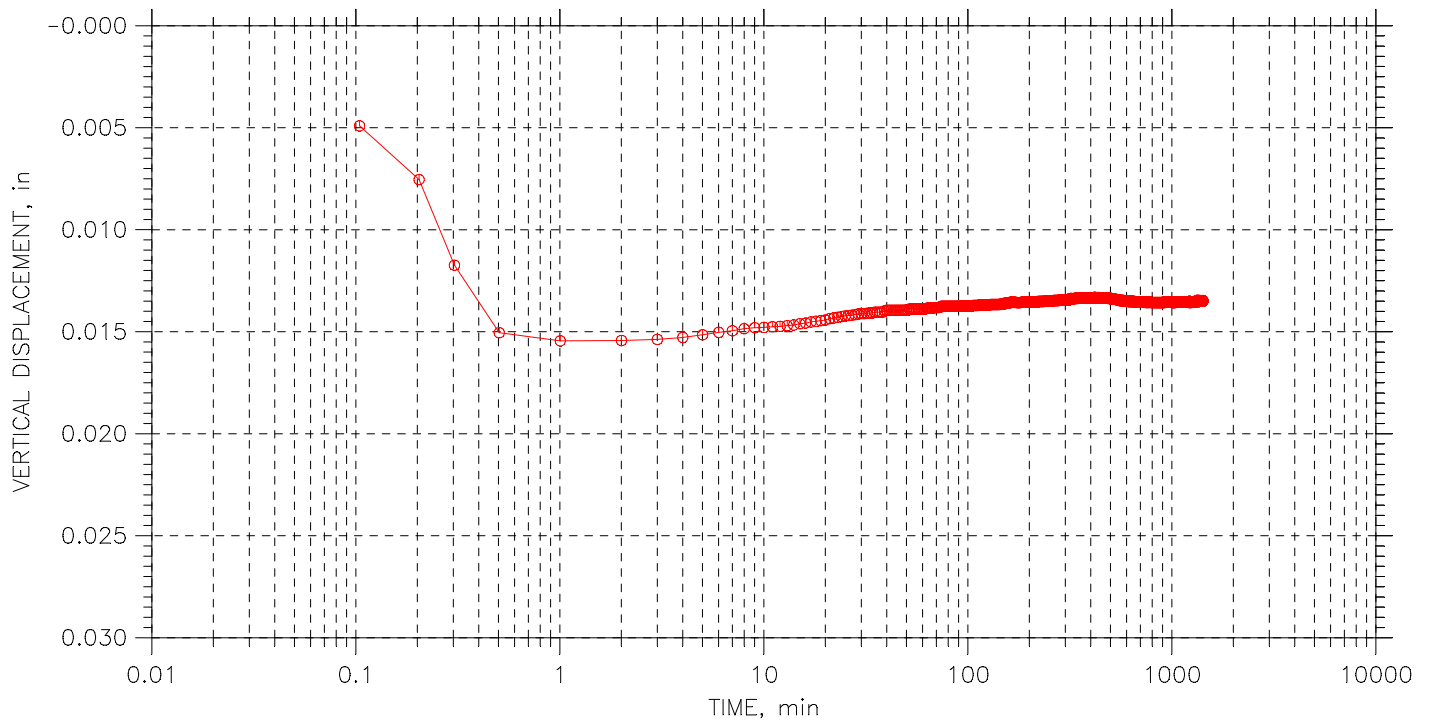
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

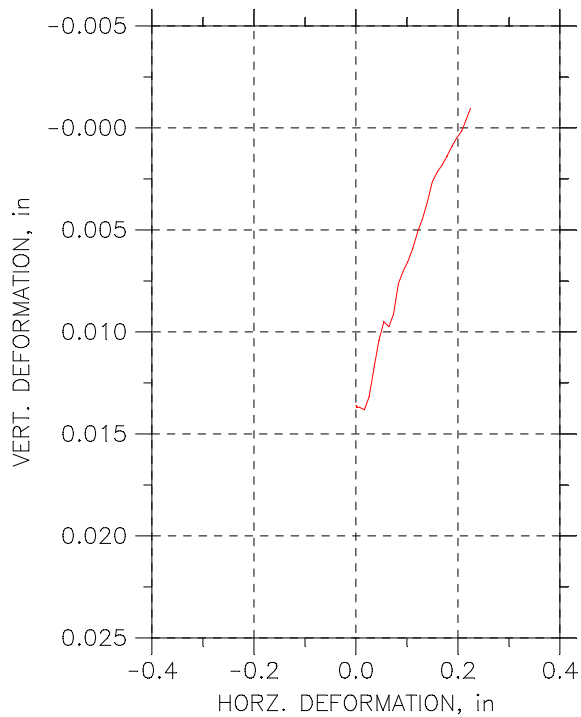
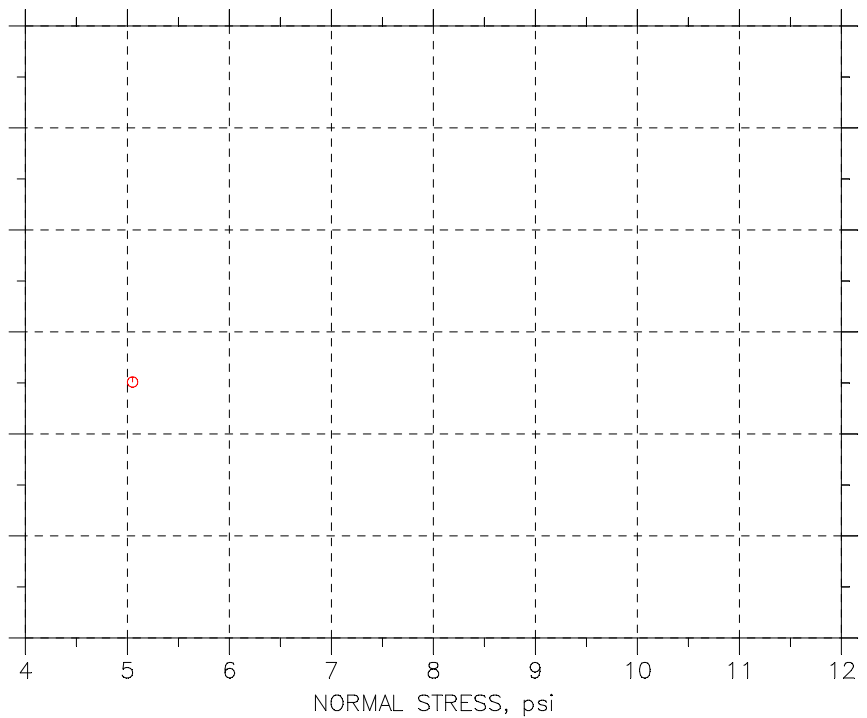
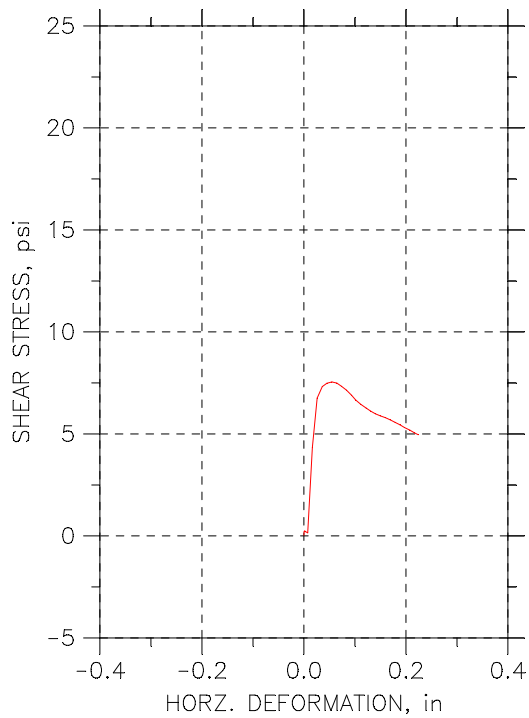
Step: 1 of 1

Stress: 5 psi



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/20/07	Depth: 18.3'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

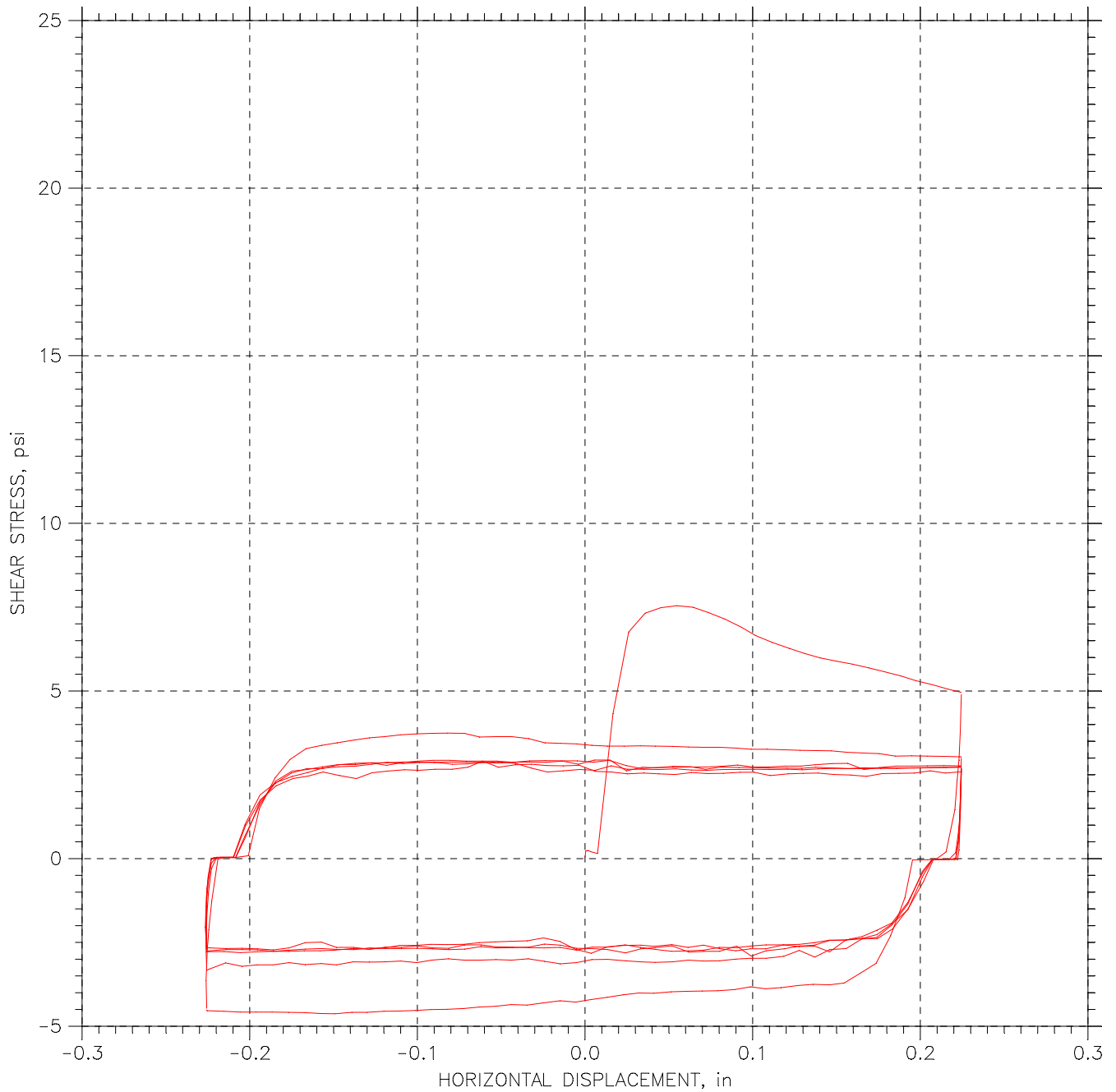
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	B-1			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	27.21		
	Dry Density, pcf	100.6		
	Saturation, %	108.86		
	Void Ratio	0.67486		
Consol. Height, in		0.98653		
Consol. Void Ratio		0.6523		
Final	Water Content, %	26.43		
	Dry Density, pcf	102.9		
	Saturation, %	111.81		
	Void Ratio	0.63827		
Normal Stress, psi		5.0505		
Max. Shear Stress, psi		7.544		
Ult. Shear Stress, psi		4.9603		
Time to Failure, min		6.0036		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		24		
Plasticity Index		26		
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)				
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)				

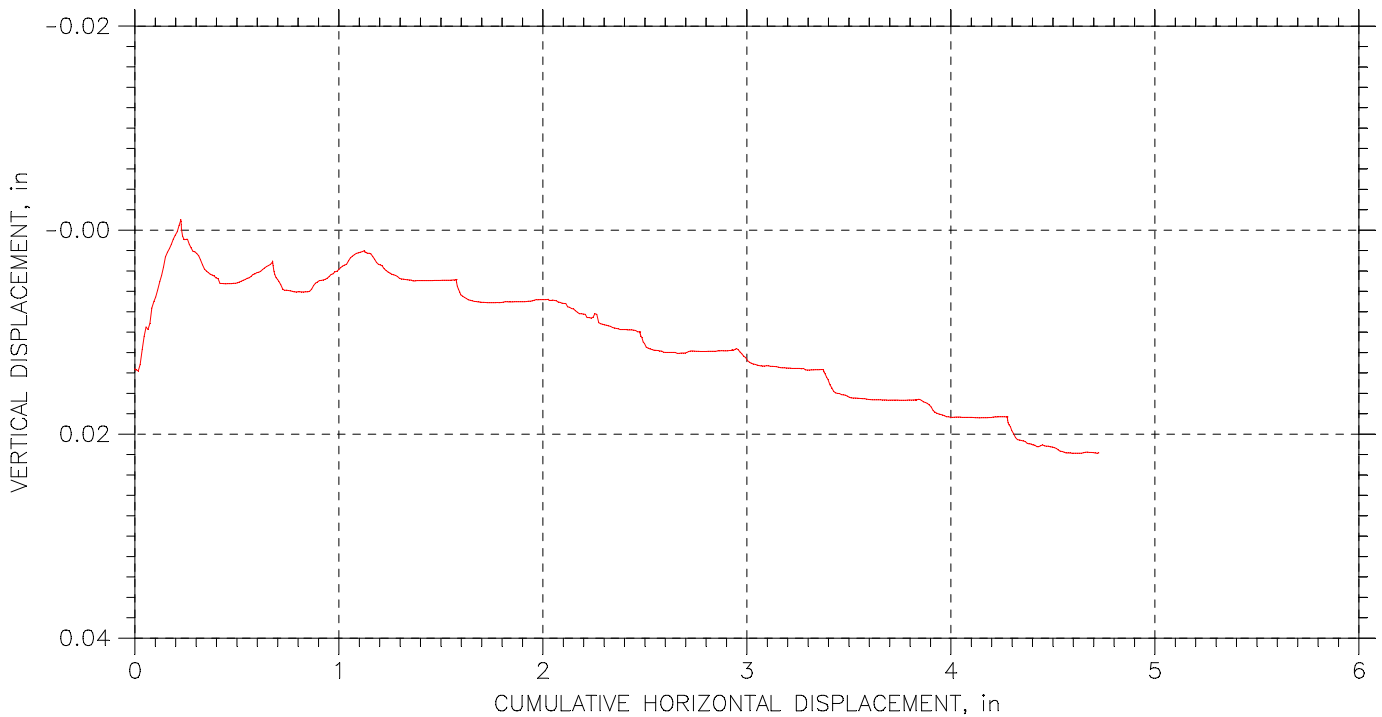
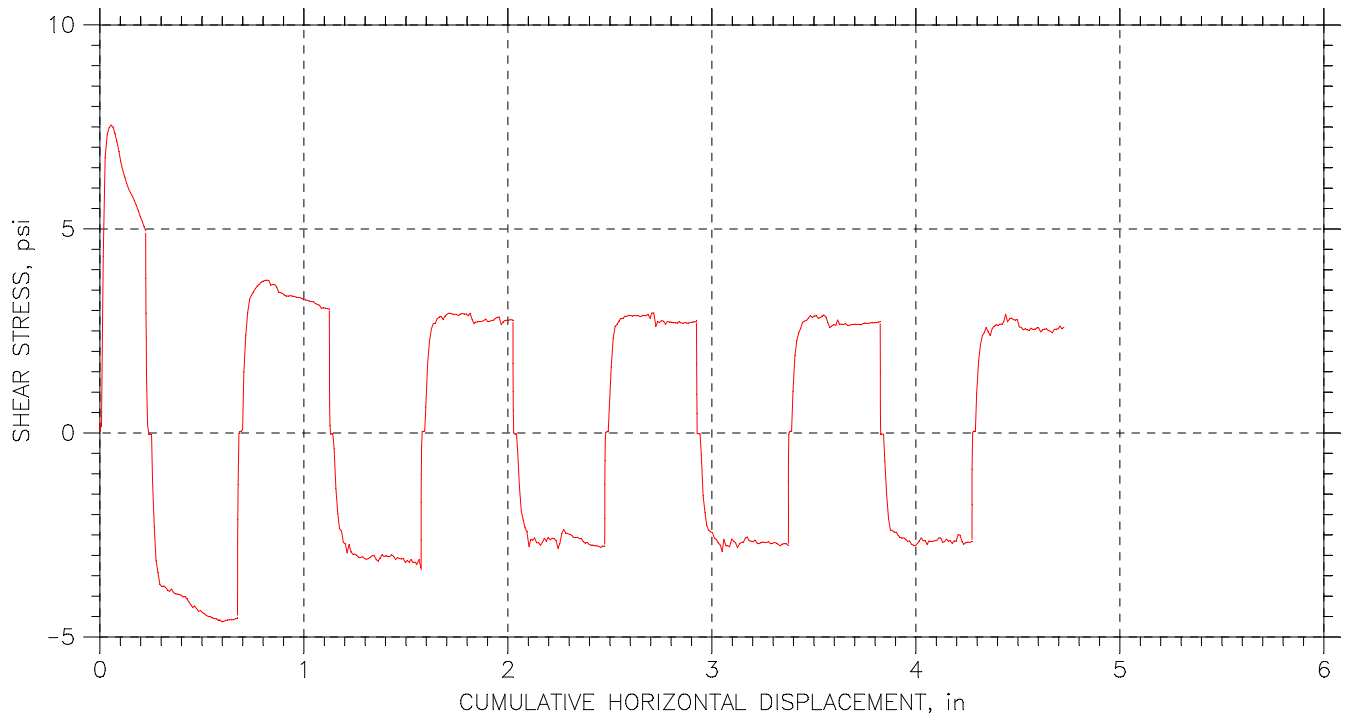
Project: Purple Line
Location: College Park, MD
Project No.: 14961
Boring No.: CP-4A
Sample Type: Pitcher
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/20/07	Depth: 18.3'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
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RESIDUAL SHEAR TEST



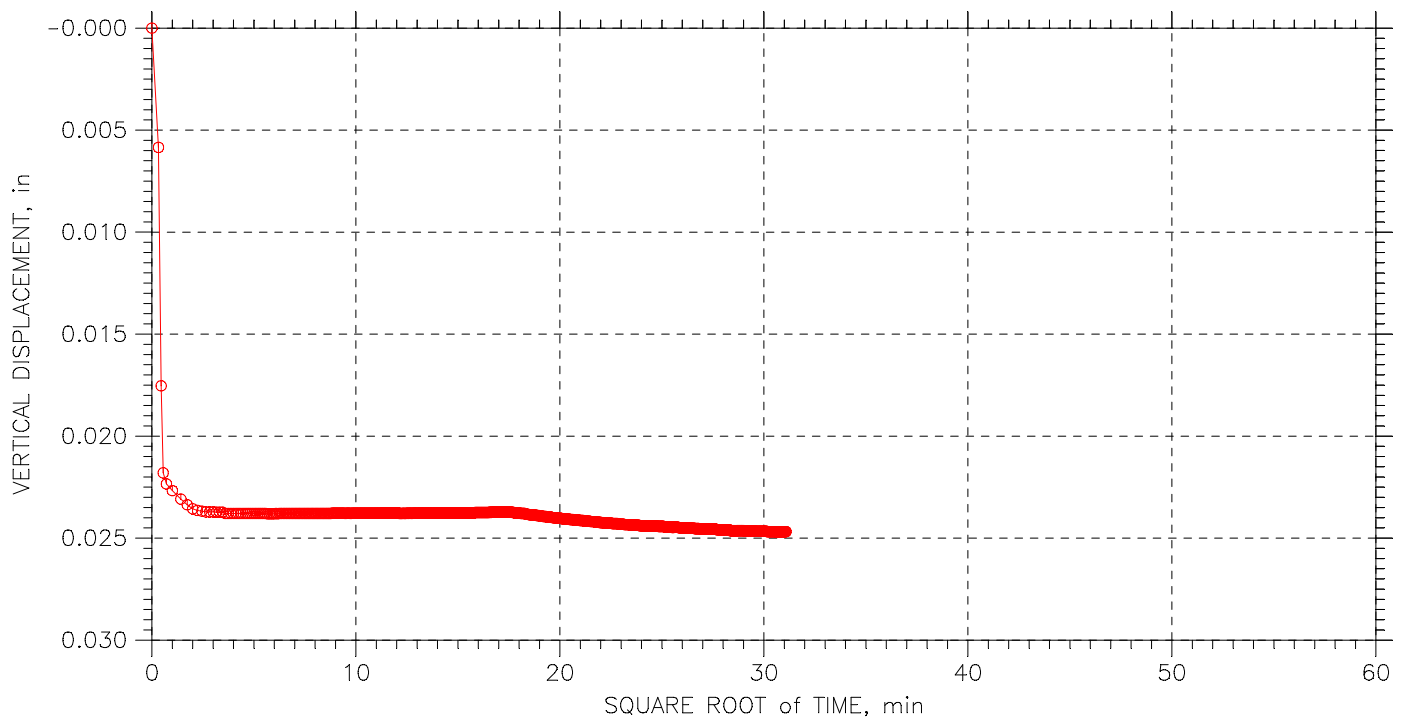
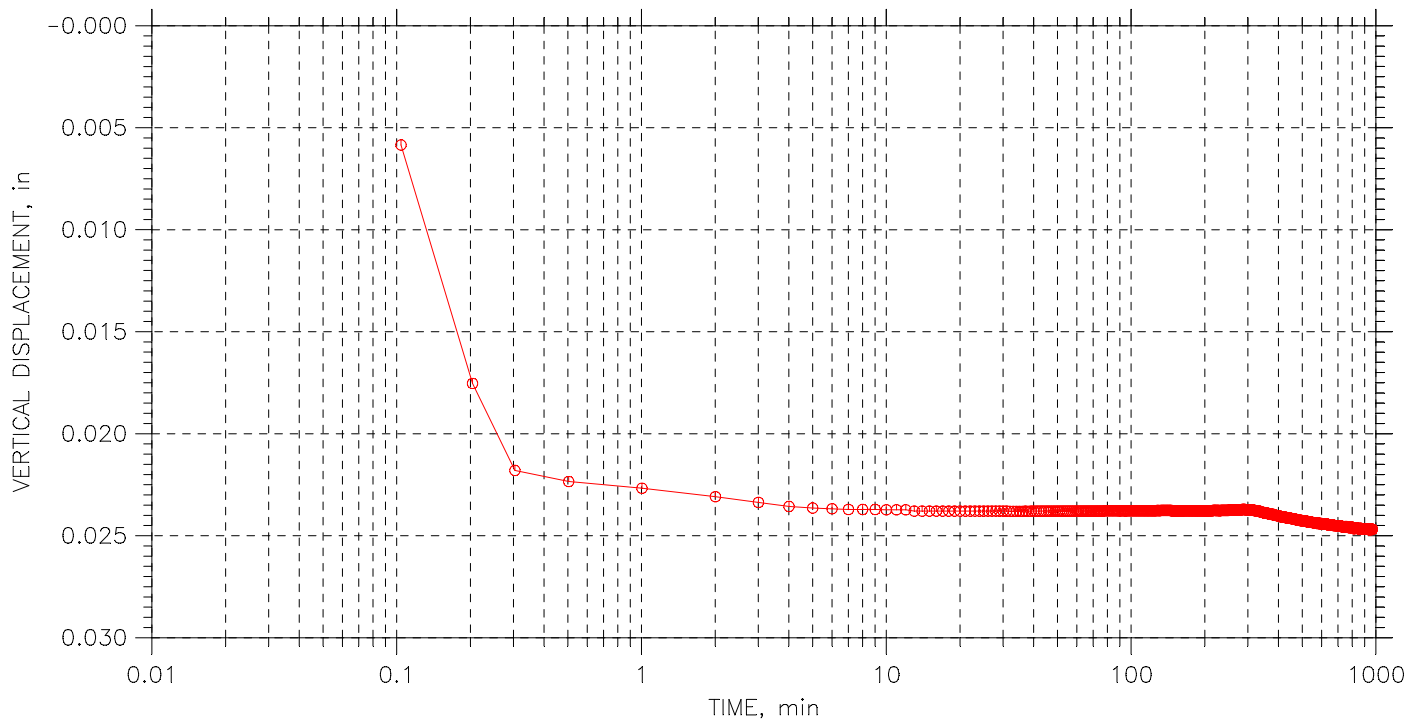
Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 8/20/07	Depth: 18.3'
Test No.: B-1	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
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DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

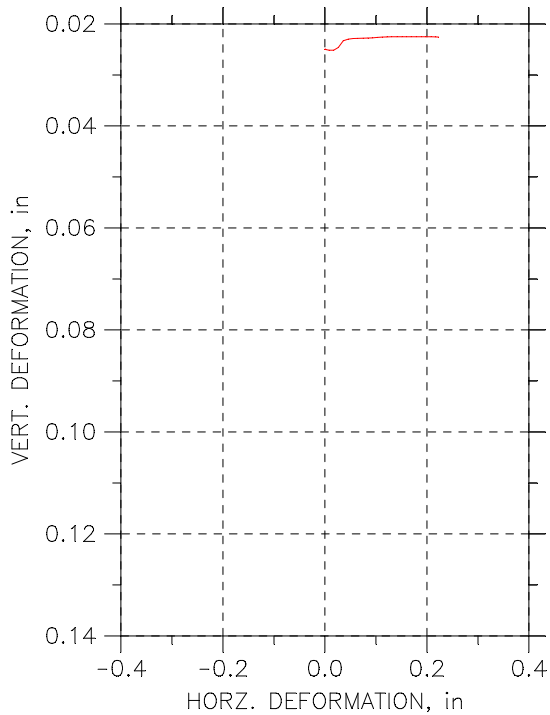
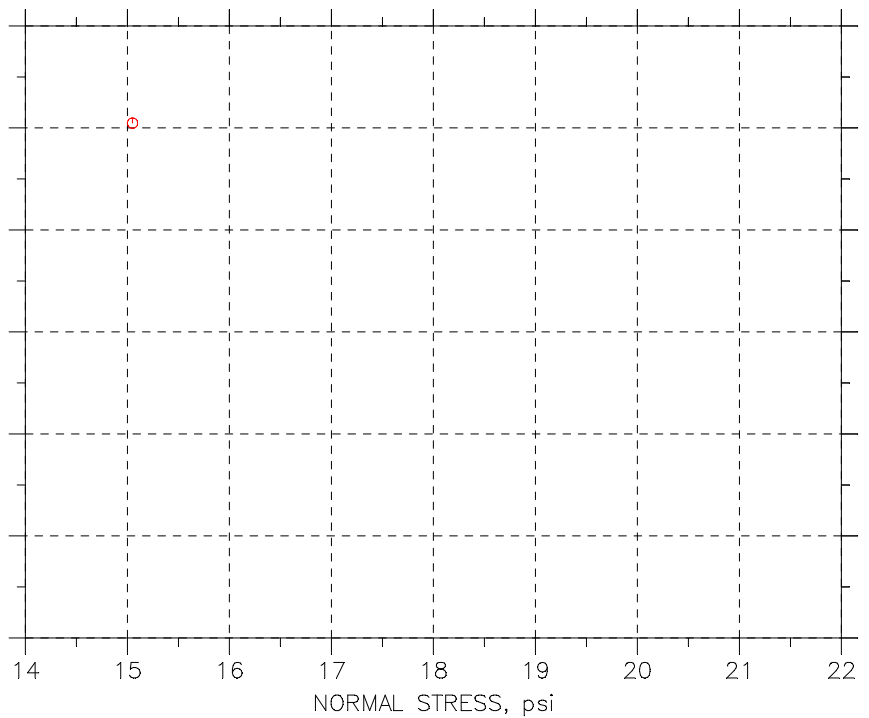
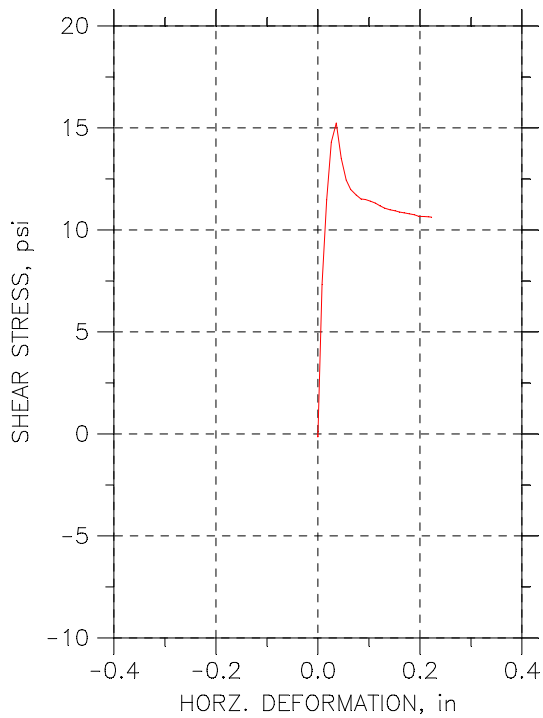
Step: 1 of 1

Stress: 15 psi



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: Gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/27/07	Depth: 18.5'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
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DIRECT SHEAR TEST REPORT



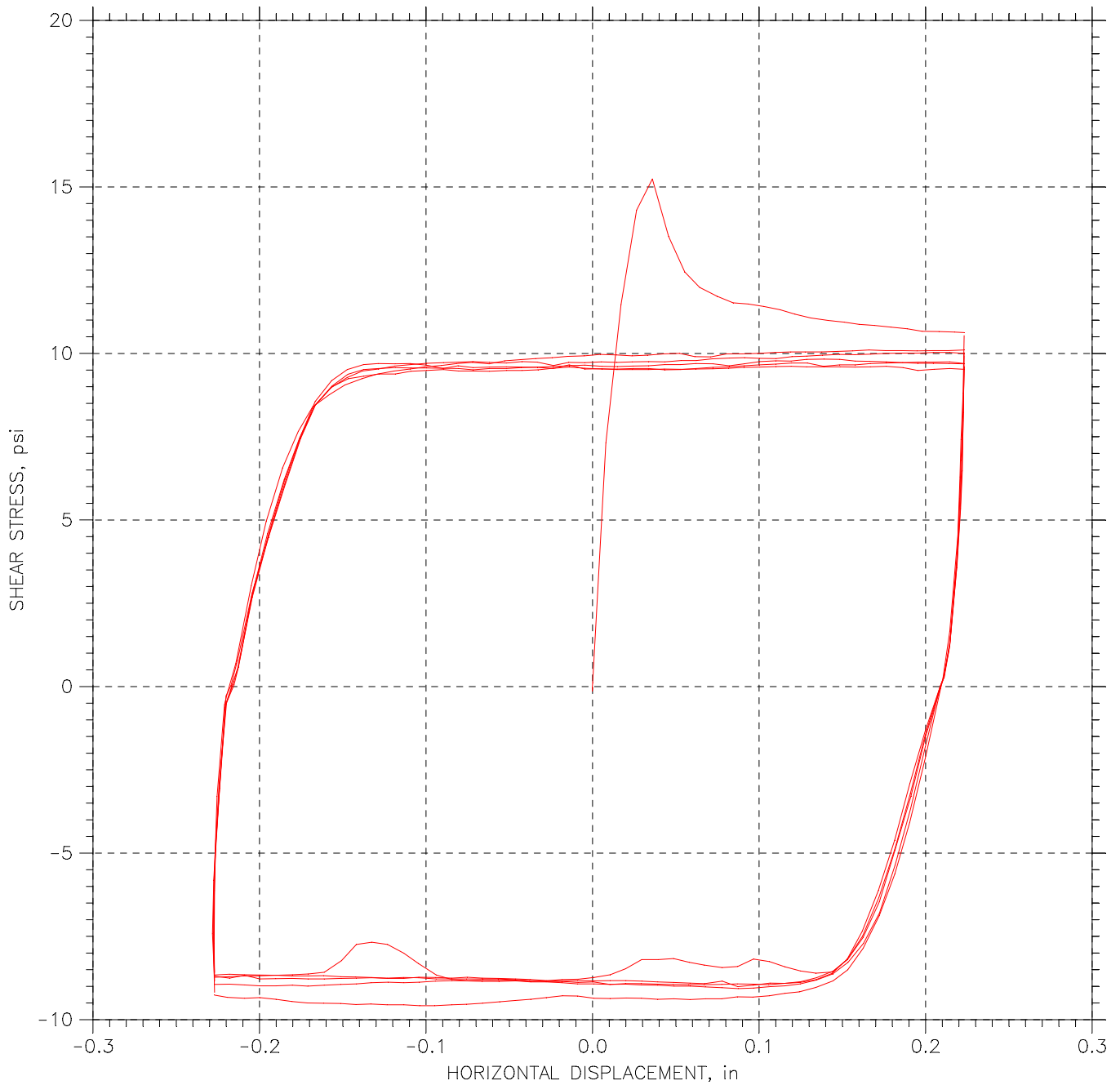
Symbol				
Test No.	B-2			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	21.73		
	Dry Density, pcf	106.		
	Saturation, %	99.45		
	Void Ratio	0.59001		
Consol. Height, in		0.97532		
Consol. Void Ratio		0.55076		
Final	Water Content, %	19.63		
	Dry Density, pcf	117.4		
	Saturation, %	121.70		
	Void Ratio	0.43559		
Normal Stress, psi		15.05		
Max. Shear Stress, psi		15.237		
Ult. Shear Stress, psi		10.624		
Time to Failure, min		5.0037		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		24		
Plasticity Index		26		
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)				
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)				

Project: Purple Line
 Location: College Park, MD
 Project No.: 14961
 Boring No.: CP-4A
 Sample Type: Pitcher

Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)

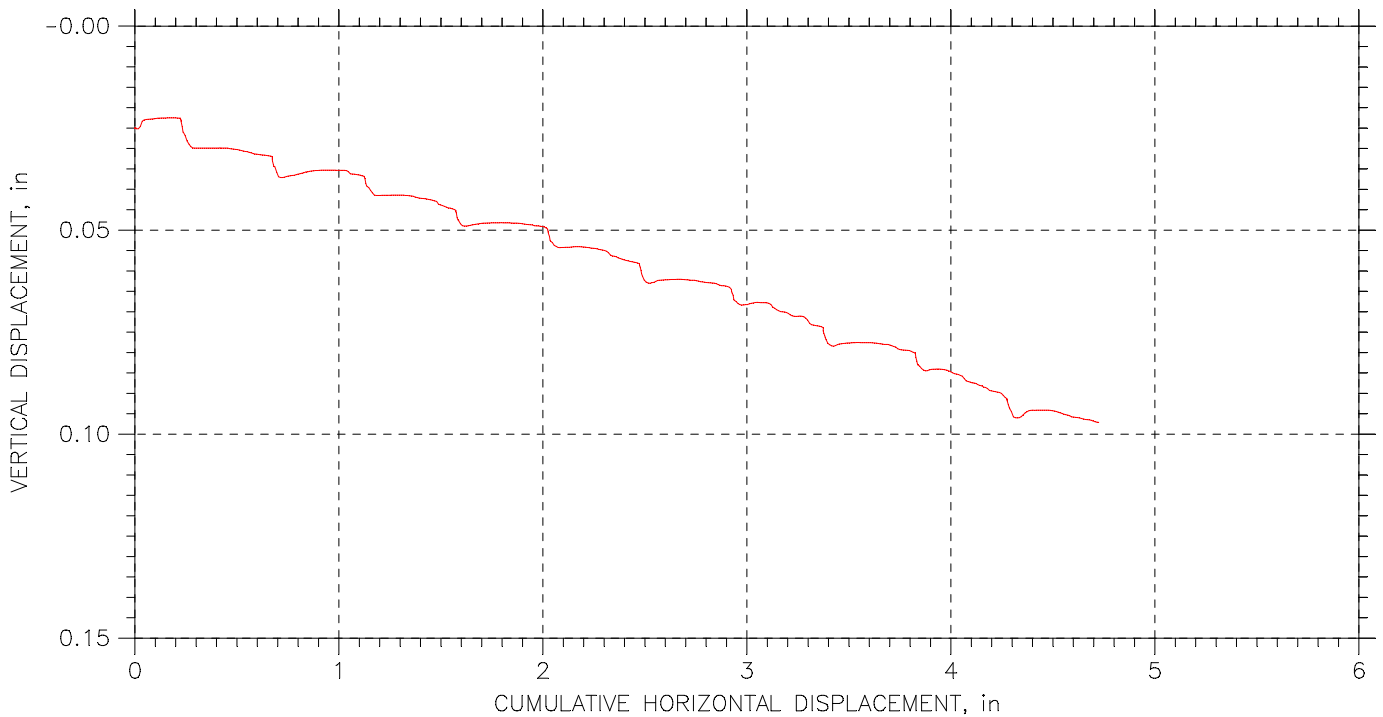
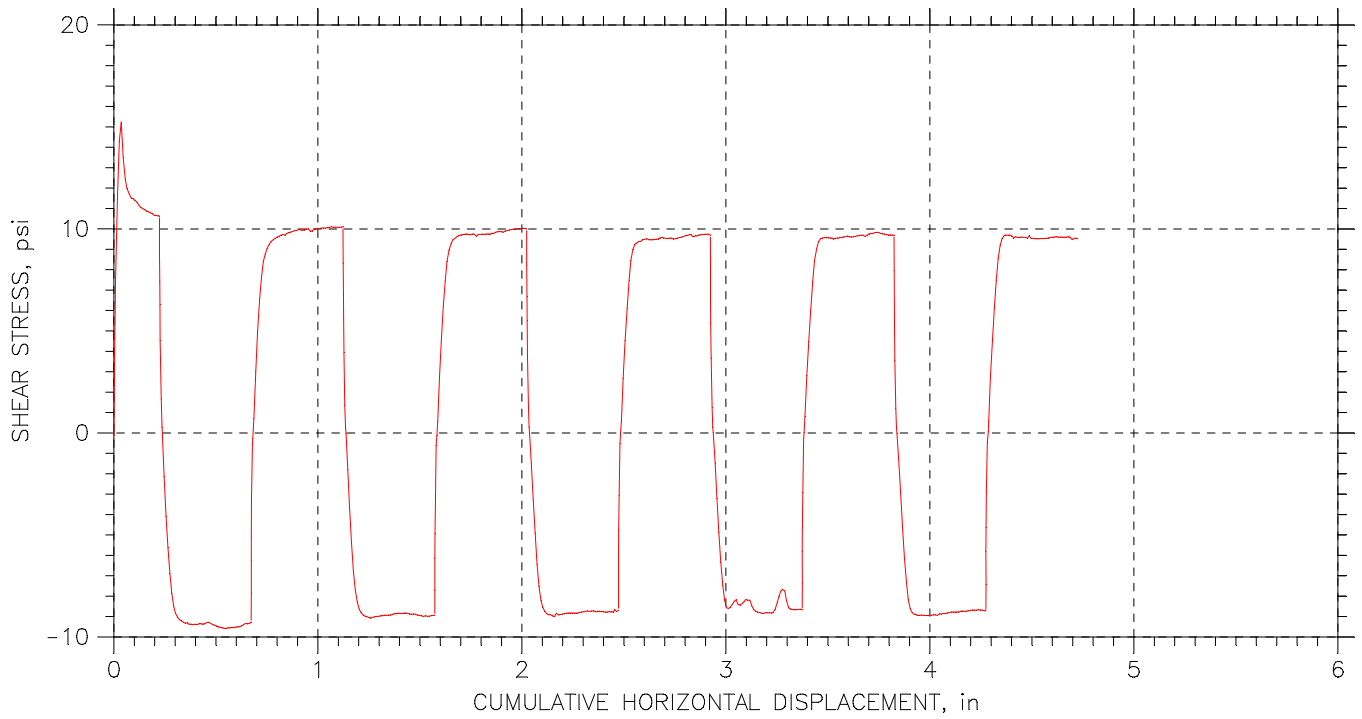
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: Gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/27/07	Depth: 18.5'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
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RESIDUAL SHEAR TEST



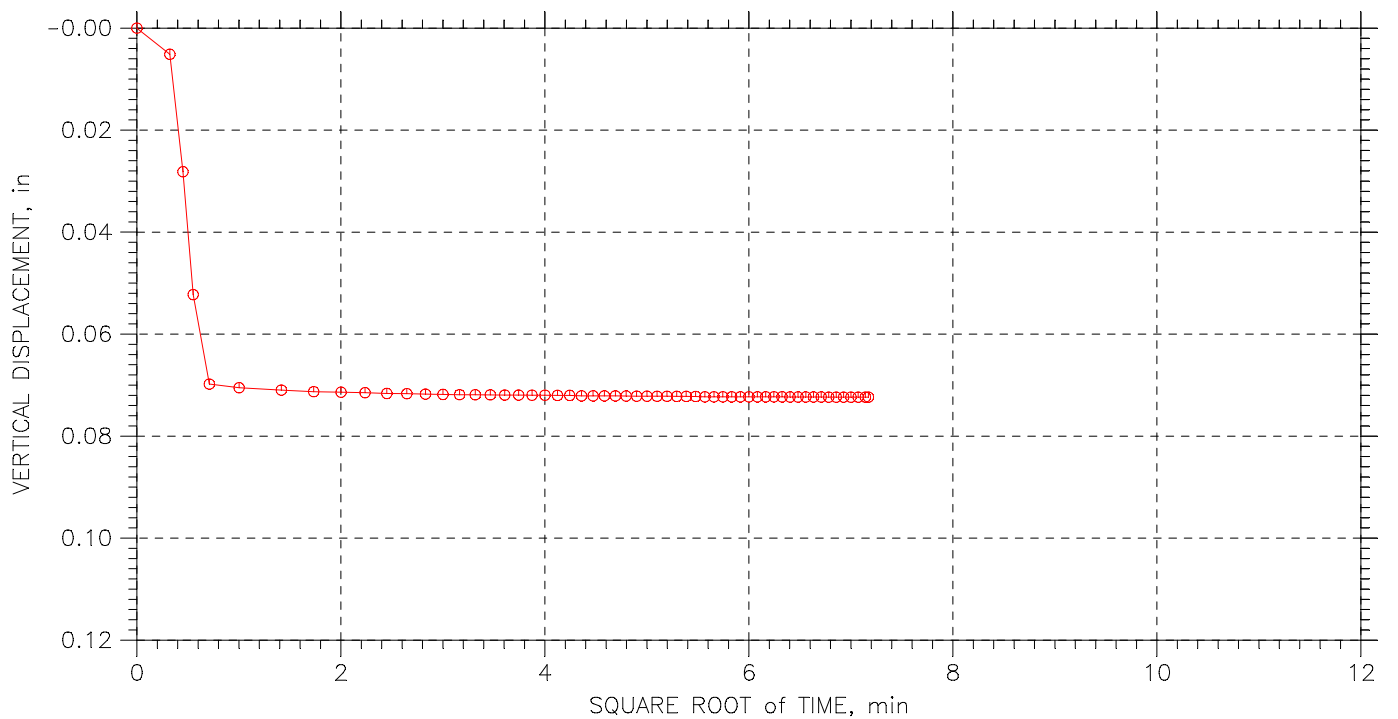
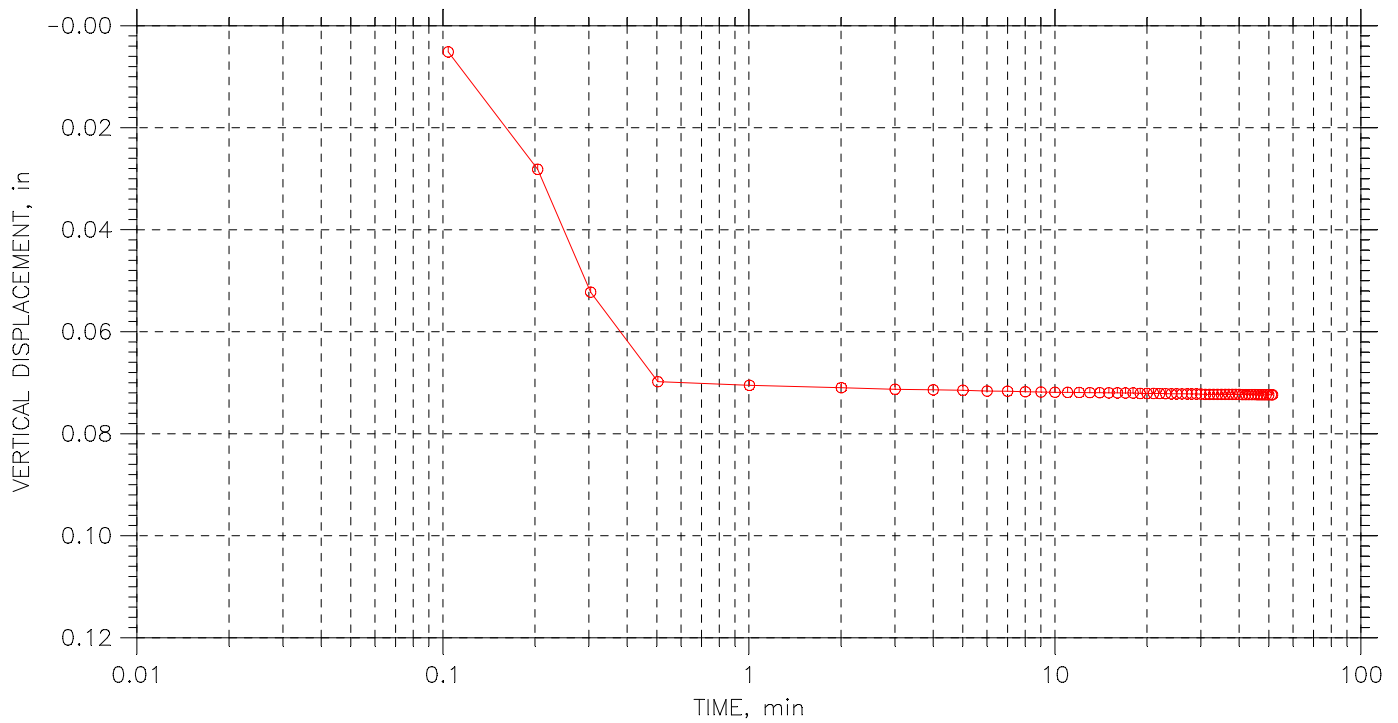
Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: Gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/27/07	Depth: 18.5'
Test No.: B-2	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
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DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

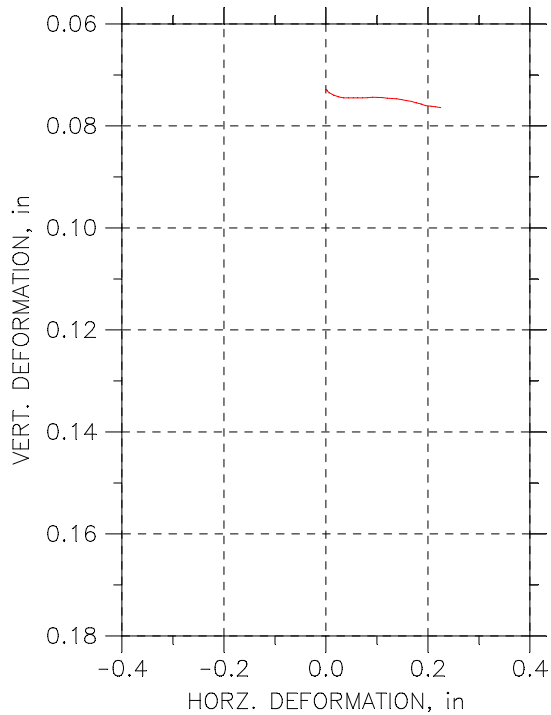
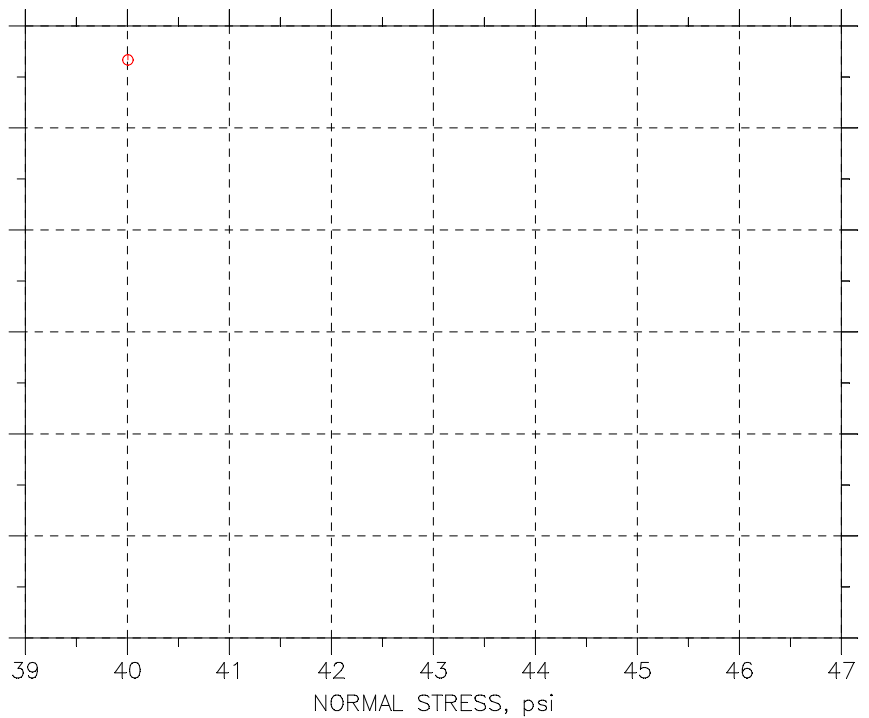
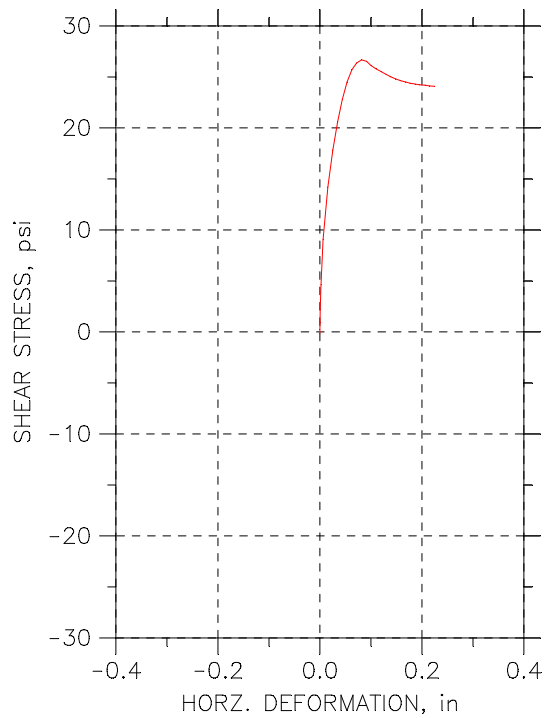
Step: 1 of 1

Stress: 40 psi



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: Gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/29/07	Depth: 18.6'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		

DIRECT SHEAR TEST REPORT

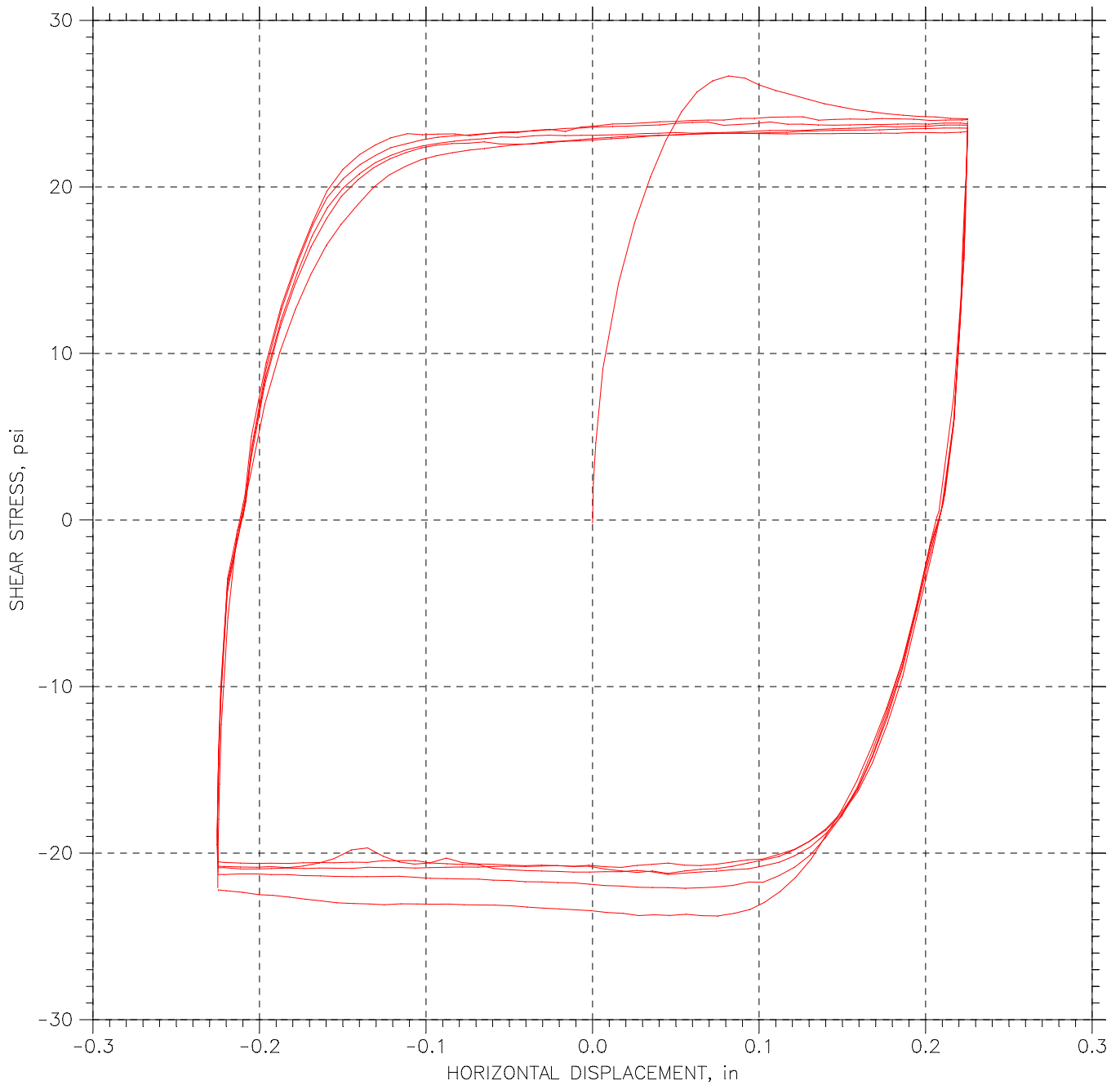


Symbol				
Test No.	B-3			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	23.36		
	Dry Density, pcf	105.8		
	Saturation, %	106.36		
	Void Ratio	0.59309		
Consol. Height, in		0.92765		
Consol. Void Ratio		0.47783		
Final	Water Content, %	19.73		
	Dry Density, pcf	127.1		
	Saturation, %	163.39		
	Void Ratio	0.32597		
Normal Stress, psi		40.005		
Max. Shear Stress, psi		26.665		
Ult. Shear Stress, psi		24.089		
Time to Failure, min		9.0033		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		24		
Plasticity Index		26		
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)				
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)				

Project: Purple Line
Location: College Park, MD
Project No.: 14961
Boring No.: CP-4A
Sample Type: Pitcher

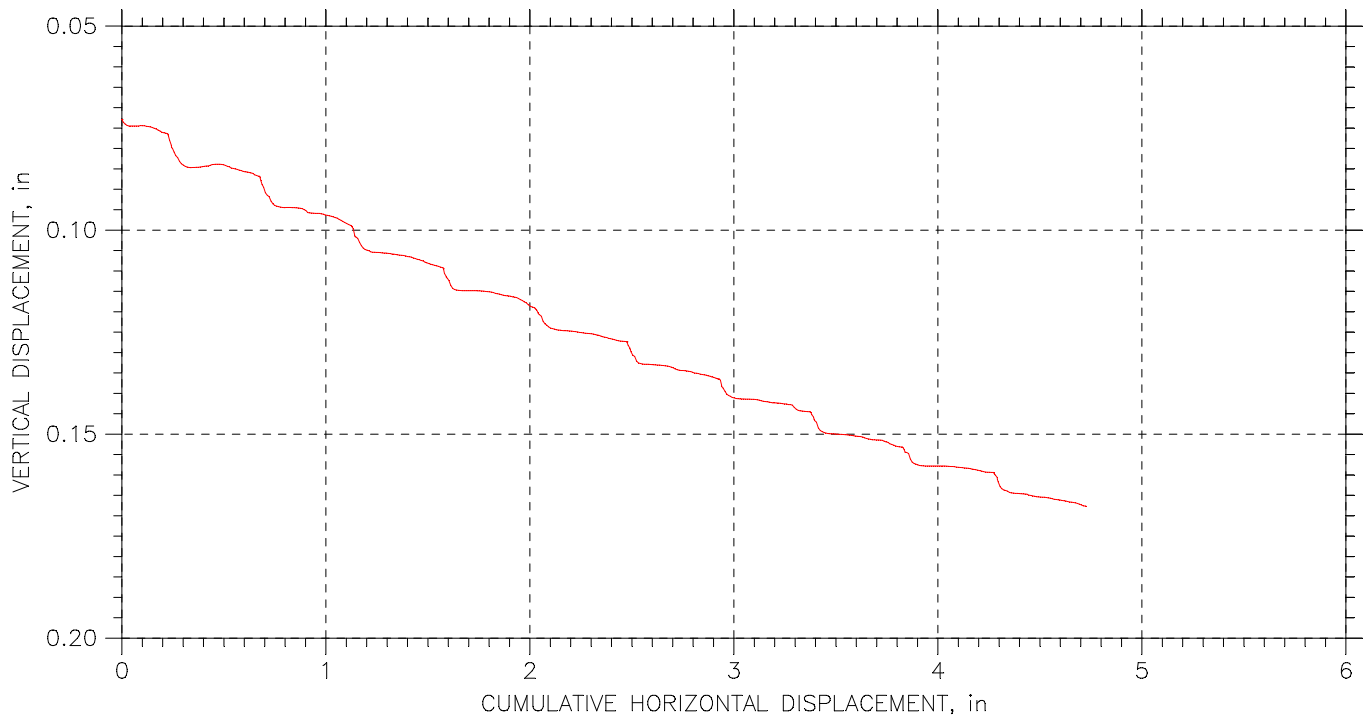
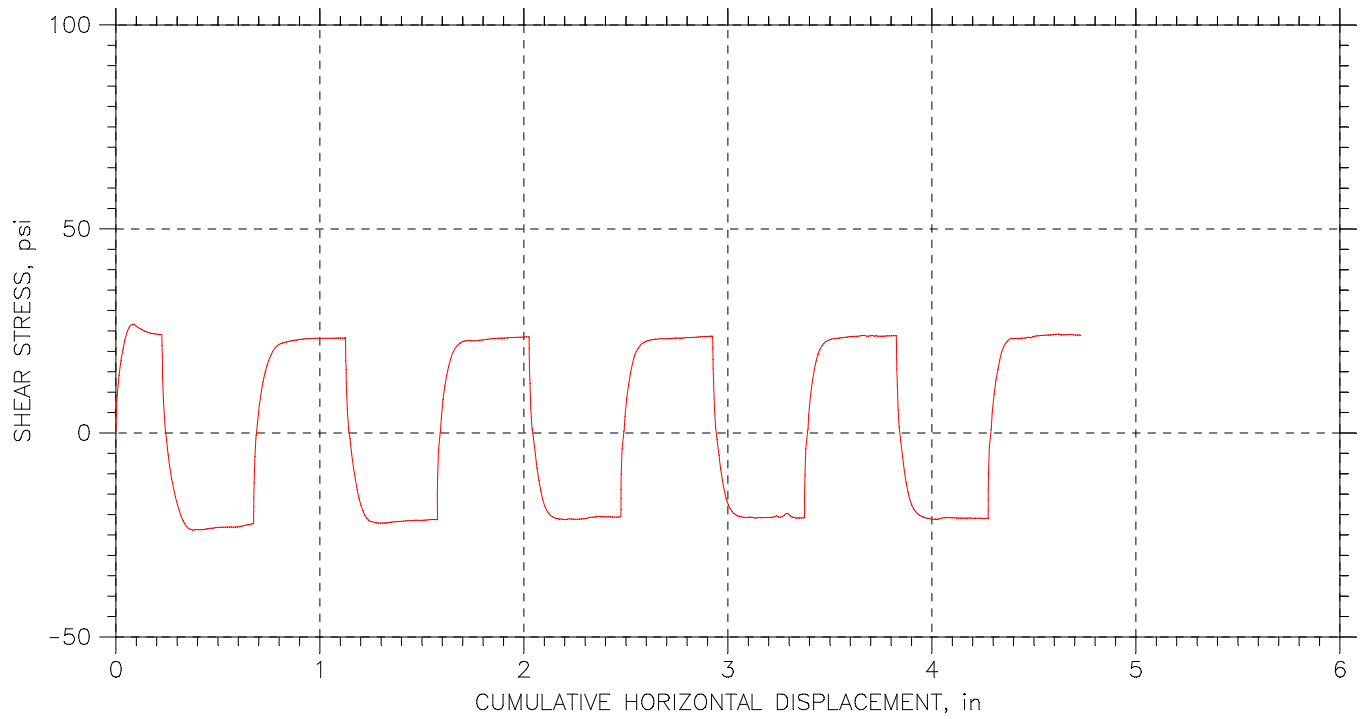
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: Gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/29/07	Depth: 18.6'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear CP-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: College Park, MD	Project No.: 14961
Boring No.: CP-4A	Tested By: Gladys	Checked By: bert
Sample No.: P-1	Test Date: 8/29/07	Depth: 18.6'
Test No.: B-3	Sample Type: Pitcher	Elevation:
Description: Mottled, Dark Brown, Yellowish Brown, Very Stiff CLAY, some fine Sand. (CH)		
Remarks: Residual Direct Shear. Constant Load (Sample allowed to swell before shearing)		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear CP-		



Appendix S

Riverdale Boring Logs



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **RD-1**

SHEET NUMBER: **1** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow stem auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Entrance to Riverdale Park**

COORD. N: **473,668.0** E: **1,333,930.0**






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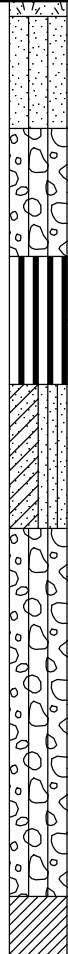


SURFACE ELEV.: **32.2 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **8/3/07** TIME: **11:20 am**

FINISH DATE: **8/7/07** TIME: **12:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"					8/6/07	10:00 am	22.2	26.0	26.0
Length		24"					8/7/07	8:45 am	13.3	66.0	66.0
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5			S	1		0.0 - 2.0	6	12	16	12	12	0-0.25' Dry, medium dense, brown, fine to coarse SAND, little organic Silt, trace roots (SM) (Topsoil)	
			S	2		2.0 - 4.0	9	8	4	4	10	31.95' Dry, medium dense, light brown, fine to coarse SAND, some fine to medium subrounded Gravel, little clayey Silt, trace roots (SM) (Fill)	
			S	3		4.0 - 6.0	4	5	5	5	4	28.2' Dry, medium dense, brown, fine to coarse subrounded and subangular GRAVEL, little fine to coarse Sand, little clayey Silt (GM) (Fill)	
			S	4		6.0 - 8.0	2	3	3	9	14	26.2' Dry, stiff, dark brown, SILT & CLAY, little fine to coarse Sand, trace roots (ML)	
			S	5		8.0 - 10.0	6	10	9	8	10	8.25' S-5A (Top 3"): Damp, medium dense, brown, fine to medium SAND, some clayey Silt (SC-SM)	
			S	6		10.0 - 12.0	7	6	5	3	3	23.95' S-5B (Bottom 7"): Wet, medium dense, brown, fine to coarse subrounded GRAVEL, some fine to coarse Sand, little clayey Silt (GM)	
			S	7		12.0 - 14.0	3	4	5	6	0	No recovery	
			S	8		14.0 - 16.0	3	3	4	3	3	14' Wet, medium stiff, brown, CLAY & SILT, little fine to medium Sand at top of sample, trace fine Gravel (CL)	



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-1**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %			
Depth Elev.														
20			S	9		16.0 - 18.0	5	8	15	17	12	16 16.2	Wet, medium dense, reddish brown, fine to medium SAND, some clayey Silt (SC-SM)	
			S	10		18.0 - 20.0	10	11	14	18	21	S-10A (Top 13"): Same as S-9 (SC-SM)		
												19.083		
			S	11		20.0 - 22.0	5	7	14	17	21	13.117	S-10B (Bottom 8"): Moist, very stiff, reddish brown, CLAY & SILT, little fine Sand (CL)	
														Same as S-10B, brown (CL)
			S	12		22.0 - 24.0	7	11	21	23	22			Same as S-10B, hard, brown (CL) Pocket penetrometer: 3.0tsf, Pocket torvane: 4.0-6.0tsf
			S	13		24.0 - 26.0	6	11	15	19	16			S-13A (Top 10"): Same as S-10B, brown, some fine to coarse Sand (CL)
												24.83		
												7.37		
			S	14		26.0 - 28.0	5	10	12	26	8	26 6.2		S-13B (Bottom 6"): Damp, medium dense, gray and brown, fine to medium SAND varved with 0.5" layers of silty Clay every 0.5" (SC)
25		S	15	28.0 - 30.0	14	19	16	61	12			Damp, very stiff, layered gray, light brown, and brown, Silty CLAY, trace fine Sand (CH) Pocket penetrometer: 4.0tsf, Pocket torvane: 4.0tsf		
		S	16	30.0 - 32.0	9	12	20	21	14			Damp, hard, mottled light brown and brown, Silty CLAY, trace fine Sand (CH)		
		S	17	32.0 - 34.0	10	16	20	24	15			Same as S-15, brown (CH) Pocket penetrometer: 3.25tsf, Pocket torvane: 4.25tsf		
		S	18	34.0 - 36.0	7	19	41	42	20	34 -1.8		Same as S-15, mottled reddish brown and brown (CH) Pocket penetrometer: 3.25tsf, Pocket torvane: 5.5tsf		
35												Damp, hard, mottled brown and gray, CLAY & SILT, trace fine Sand (CL) Pocket penetrometer: 3.25tsf, Pocket torvane: 5.0tsf		

PURPLE LINE BORING LOG - PURPLE LINE RIVERDALE DRAFT GINT LOGS.GPJ MAIN.LB.GLB 2/6/08



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-1**

SHEET NUMBER: 3 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE			SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24			REC. (in.)
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
												Depth Elev.	
			S	19		36.0 - 38.0	14	23	24	35	18	36 -3.8	Moist, hard, brownish gray, SILT & CLAY and fine to medium Sand (CL-ML)
			S	20		38.0 - 40.0	16	30	23	32	20	38 -5.8	S-20A (Top 10"): Damp, hard, mottled reddish brown and brown, Silty CLAY, trace fine to coarse Sand (CH)
												38.83 -6.63	Pocket penetrometer: 4.0tsf, Pocket torvane: 8.0tsf
			S	21		40.0 - 42.0	15	23	28	45	16	40 -7.8	S-20B (Bottom 10"): Damp, very dense, brown, fine to medium SAND, little silty Clay (SC)
40			S	22		42.0 - 44.0	18	14	23	45	18		Damp, hard, mottled reddish brown and grayish brown, Silty CLAY, trace fine to medium Sand (CH)
			S	23		44.0 - 46.0	5	10	23	45	18	44.33 -12.13	S-23A (Top 4"): Damp, hard, brown, Silty CLAY, trace fine to medium Sand (CH)
45													S-23B (Bottom 14"): Damp, dense, gray, fine to medium SAND and Silty Clay (SC-SM)
			S	24		46.0 - 48.0	5	10	12	24	16	46 -14.05	S-24A (Top 3"): Damp, very stiff, mottled brown and dark brown, Silty CLAY, trace fine to medium Sand (CH)
													S-24B (Bottom 13"): Damp, medium dense, brownish gray, fine to medium SAND, some Silt (SM)
			S	25		48.0 - 50.0	51	36	51	51	20		Same as S-24B, very dense (SM)
			S	26		50.0 - 52.0	21	27	23	35	24		Same as S-24B, very dense (SM)
50			S	27		52.0 - 54.0	21	41	60	63	23		Same as S-24B, very dense, gray (SM)
			S	28		54.0 - 56.0	22	38	70	94	24		Same as S-24B, very dense, gray (SM)
55			S	29		56.0 - 58.0	26	37	57	54	24		Same as S-24B, very dense, gray in top 12" and brown in bottom 12" (SM)

PURPLE LINE BORING LOG PURPLE LINE RIVERDALE DRAFT GINT LOGS.GPJ MAINLIB.GLB 2/6/08



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-1**

SHEET NUMBER: **4** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS						
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)							
							CORING											
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %							
Depth Elev.																		
60			S	30		58.0 - 60.0	5	7	15	43	24	Same as S-24B, mottled gray and brown (SM)						
				31		60.0 - 62.0	15	21	51	83	24		Same as S-24B, very dense, reddish brown in top 12" and mottled gray and brown in bottom 12" (SM)					
				32		62.0 - 64.0	16	36	70	90	24							
				33		64.0 - 66.0	7	9	28	43	24							
				34		66.0 - 68.0	18	23	59	66	24							
				35		68.0 - 70.0	23	29	35	52	24							
				Bottom of boring at 70'. Offset boring drilled to obtain pitcher sample. See boring log for RD-1A. Boring tremie grouted with cement grout upon completion. Surfaced restored with seed and straw.														
				75														



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **RD-1A**

SHEET NUMBER: 1 of 2

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Riverdale, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**

LOCATION: **Entrance to Riverdale Park**

COORD. N: **473,669.0** E: **1,333,931.0**

STN. NO.: OFFSET:

SURFACE ELEV.: **32.2 feet**

DATUM: **NAD 83/91 and NAVD 88**

DRILLER: **J. Sies**
INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Mud rotary wash using revert**
RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

START DATE: **8/7/07** TIME: **12:20 pm**

FINISH DATE: **8/8/07** TIME: **10:30 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■	U □	P □	G □	C □	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.				2.87"			8/8/07	7:35 am	5.3	9.0	21.0
Length				36"							
Hammer Wt.			Drill Rod Size								
Hammer Fall			I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

BORING NUMBER: **RD-2**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow stem auger and mud rotary wash using reverse circulation**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **South of ballfield four in Riverdale Park**

COORD. N: **472,654.0** E: **1,333,644.0**






STN. NO.: OFFSET:









SURFACE ELEV.: **26.5 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **8/8/07** TIME: **12:30 pm**

FINISH DATE: **8/10/07** TIME: **3:00 pm**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"					8/8/07	1:00 pm	8.0	8.0	8.0
Length		24"					8/9/07	7:40 am	9.0	24.0	24.0
Hammer Wt.		140lbs	Drill Rod Size				8/10/07	7:40 am	5.8	68.0	70.0
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5			S	1		0.0 - 2.0	6	14	21	15	10	0-0.25' Topsoil	
											0.25' Dry, hard, brown, SILT, little fine Sand, trace subrounded		
											26.25' Gravel, trace roots (ML)		
10			S	2		4.5 - 6.5	11	20	21	17	11	4.5' Moist, dense, brown, fine to medium, rounded to subangular GRAVEL, some Sand, trace silty Clay (GP-GC)	
													8.0': Water observed during drilling.
10			S	3		9.5 - 11.5	5	5	9	14	0	No recovery	
10			S	4		14.5 - 16.5	8	10	14	15	18	14.5' Damp, very stiff, mottled brown and grayish brown,	



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-2**

SHEET NUMBER: 2 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
											Depth Elev.		
													CLAY & SILT, little fine Sand (CL) Pocket penetrometer: 3.25tsf; Pocket torvane: 8.5tsf

PURPLE LINE BORING LOG - PURPLE LINE RIVERDALE DRAFT GINT LOGS.GPJ MAIN.LB.GLB 2/6/08



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-2**

SHEET NUMBER: **3** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
40			S	14	[Redacted]	36.0 - 38.0	10	20	25	33	24	Same as S-5, mottled gray, brown, and red (CH) Pocket penetrometer: 3.25tsf; Pocket torvane: 6.5tsf	
			S	15		38.0 - 40.0	14	30	40	48	24	Same as S-5, mottled brown and red (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
			S	16		40.0 - 42.0	14	26	36	45	24	Same as S-5, mottled brown, reddish brown, and gray, trace fine Sand (CH)	
			S	17		42.0 - 44.0	24	35	38	40	24	Same as S-5, brown, trace fine Sand in bottom 10" (CH)	
45			S	18		44.0 - 46.0	14	20	18	22	24	Same as S-5, finely layered brown and gray, trace fine Sand (CH)	
			S	19		46.0 - 48.0	14	18	23	24	24	Same as S-5, trace fine rounded Gravel, trace fine Sand (CH) Pocket penetrometer: 2.0-4.0tsf	
			S	20		48.0 - 50.0	17	21	28	32	24	Same as S-5, brown (CH)	
		50		S		21	50.0 - 52.0	15	24	27	29	24	Same as S-5, brown (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	22		52.0 - 54.0	26	31	37	49	24	Same as S-5, brown, trace fine Sand (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
55				S		23	54.0 - 56.0	11	21	28	30	24	Same as S-5, brown in top 14" and dark gray in bottom 10", trace fine Sand, 0.5" layer of fine gravel-sized clay balls (CH)
				S		24	56.0 - 58.0	17	21	27	32	20	Same as S-5, grayish brown, trace fine Sand (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf



Parsons
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BORING LOG

(continued)

BORING NUMBER: **RD-2**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)	
							CORING					
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
Depth Elev.												
60			S	25		58.0 - 60.0	18	27	37	35	24	Same as S-5, grayish brown, trace fine Sand, two 0.5" layers of brown, fine to medium gravel-sized clay balls (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	26		60.0 - 62.0	39	31	40	42	24	Same as S-5, trace fine Sand, 0.5" layer of fine gravel-sized clay balls (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	27		62.0 - 64.0	10	17	24	33	24	Same as S-5, trace fine, light gray, subrounded clay balls, trace fine Sand, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	28		64.0 - 66.0	10	15	27	42	24	Same as S-5, trace fine, light gray, subrounded clay balls in top 12", trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
65			S	29		66.0 - 68.0	15	24	27	29	24	Same as S-5, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	30		68.0 - 70.0	24	28	26	35	24	Same as S-5, trace coarse Gravel, trace fine Sand (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	31		70.0 - 72.0	27	30	44	41	17	70.0': Switch to mud rotary wash drilling using drag bit and revert. Augers remain in hole as casing.
70			S	32		72.0 - 74.0	15	25	25	28	22	Same as S-5, dark gray, trace fine Sand, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf Same as S-5, trace fine Sand (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	33		74.0 - 76.0	9	14	29	32	12	Same as S-5, trace fine Sand, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
			S	34		76.0 - 78.0	20	26	35	34	24	Same as S-5, trace gray, fine to medium gravel-sized clay balls, trace fine Sand, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf
75												



Parsons
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BORING LOG

(continued)

BORING NUMBER: **RD-2**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
80			S	35		78.0 - 80.0	8	17	27	34	24	Same as S-5, trace gray, fine to medium gravel-sized clay balls at tip of spoon, trace fine Sand (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
			S	36		80.0 - 82.0	10	19	21	25	24	Same as S-5, trace fine, gray, subangular clay balls, 0.5" layers with trace fine Sand (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
			S	37		82.0 - 84.0	20	33	40	58	24	Same as S-5, trace fine, gray, subangular clay balls, trace fine Sand, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
			S	38		84.0 - 86.0	16	20	20	30	22	Same as S-5, trace fine, gray, subangular clay balls, trace fine Sand, trace lignite (CH) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
			S	39		86.0 - 86.9	93	100/5"			11	86 -59.5 Wet, very dense, dark gray, fine to coarse subangular SAND, some fine to medium subangular clay balls, some silty Clay binder, trace lignite (SM)	
85			S	40		88.0 - 90.0	14	19	22	29	14	88 -61.5 Moist, hard, dark gray, Silty CLAY, trace fine to medium, light gray, subangular clay balls, trace fine Sand (CH)	
												Bottom of boring at 90'. Offset boring drilled to obtain pitcher samples. See boring log for RD-2A. Boring tremie grouted with cement grout upon completion. Surface restored with seed and straw.	
90													
95													

BORING LOG

BORING NUMBER: RD-2A

SHEET NUMBER: 1 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Riverdale, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: **E2CR, Inc.**

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DRILLING METHOD: Mud rotary wash using revert

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: South of ballfield four in Riverdale Park

COORD. N: 472,653.0 E: 1,333,641.0






STN. NO.: OFFSET:

SURFACE ELEV.: 26.7 feet

DATUM: **NAD 83/91 and NAVD 88**

START DATE: 8/15/07 TIME: 8:45 am

FINISH DATE: 8/16/07 TIME: 11:30 am

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
				2.87"							
				3"			8/15/07	9:20 am	7.0	0.0	7.0
				36"			8/16/07	8:40 am	0.0	19.5	55.0
			Drill Rod Size								
			I.D. (O.D.)								

[illegible]

BORING LOG

(continued)

BORING NUMBER: **RD-2A**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Riverdale, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]

BORING LOG

(continued)

BORING NUMBER: RD-2A

SHEET NUMBER: 3 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Riverdale, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]



Parsons
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BORING LOG

(continued)

BORING NUMBER: **RD-2A**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
60													
65			P	3		65.0 - 68.0						36	65 -38.3 Damp, hard, dark gray, Silty CLAY (CH)
70													Bottom of boring at 68'. Well installed with 10' screen 56.0-66.0' and sealed with bentonite upon completion. See separate appendix for well installation log. Surface restored with seed and straw.
75													



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BORING LOG

BORING NUMBER: **RD-3**

SHEET NUMBER: **1** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DRILLING METHOD: **Hollow stem auger**

RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**

LOCATION: **Southeast corner of Riverdale Park**

COORD. N: **471,836.0** E: **1,333,719.0**






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






SURFACE ELEV.: **26.1 feet**

DATUM: **NAD 83/91 and NAVD 88**

START DATE: **8/17/07** TIME: **12:30 pm**

FINISH DATE: **8/23/07** TIME: **11:00 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		1.375"					8/20/07	8:00 am	16.0	28.0	30.0
Length		24"					8/22/07	7:55 am	14.2	62.0	64.0
Hammer Wt.		140lbs	Drill Rod Size				8/22/07	12:30 pm	26.2	88.0	90.0
Hammer Fall		30"	I.D. (O.D.)				8/23/07	7:00 am	21.0	88.0	90.0

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS		
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)			
							CORING							
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %			
5			S	1		0.0 - 2.0	6	10	7	6	18	0.0	0-0.3' Dry, brown, SILT (ML) (Topsoil)	
												0.3	Dry, very stiff, light brown, CLAY & SILT, trace fine subrounded Gravel, trace fine Sand, trace roots (CL)	
10			S	2		4.5 - 6.5	7	8	7	10	16		Dry, very stiff, mottled white, light and orangish brown, CLAY & SILT, trace fine to medium Sand, trace roots, trace mica (CL)	
10			S	3		9.5 - 11.5	8	12	12	10	9	9.5	Damp, medium dense, brown, fine to coarse, subrounded to angular, quartz GRAVEL, some fine to coarse Sand, little brown, clayey Silt binder (GM)	
												16.6		
			S	4		14.5 - 16.5	4	6	8	8	17	14.5	14.0': Water observed during drilling.	
												11.6	S-4A (Top 10''): Moist, medium dense, pinkish gray, fine	



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BORING LOG

(continued)

BORING NUMBER: **RD-3**

SHEET NUMBER: **2** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**









LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
Depth Elev.													
												15.3 to medium SAND, some Silt (SM)	
												10.8 S-4B (Bottom 7"): Moist, stiff, layered (0.25-1.0") red and brown, CLAY with frequent pockets (1" Ø) of pinkish gray, fine to medium Sand (CH)	
20			S	5		19.5 - 21.5	8	7	10	14	20	19.5 Damp, very stiff, mottled brown and pinkish gray, CLAY & SILT, some fine to medium Sand (CL)	
25			S	6		24.5 - 26.5	6	9	10	15	22	Damp, very stiff, dark gray, CLAY & SILT, trace fine to medium Sand (CL) Pocket penetrometer > 4.5tsf; Pocket torvane > 9.0tsf	
			S	7		28.0 - 30.0	7	12	18	23	16	Same as S-6, Hard (CL) Pocket penetrometer: 3.5tsf; Pocket torvane > 9.0tsf	
30			S	8		30.0 - 32.0	10	16	22	22	10	Same as S-6, Hard with frequent, dry, light gray, medium gravel-sized clay balls at 4" spacing (CL)	
			S	9		32.0 - 34.0	10	15	22	22	24	Same as S-6, Hard with frequent, dry, light gray, medium gravel-sized clay balls, trace lignite (CL) Pocket penetrometer: 4.0tsf; Pocket torvane: 5.0tsf	
35			S	10		34.0 - 36.0	12	15	19	23	20	Same as S-6, Hard with frequent, dry, light gray, medium gravel-sized clay balls, trace lignite (CL) Pocket penetrometer: 4.0tsf; Pocket torvane: 6.0tsf	



Parsons
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Quade &
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BORING LOG

(continued)

BORING NUMBER: **RD-3**

SHEET NUMBER: **3** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**





LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
40			S	11		36.0 - 38.0	4	8	17	20	12	Same as S-6 with frequent, dry, light gray, medium gravel-sized clay balls, trace lignite (CL)	
			S	12		38.0 - 40.0	8	17	32	33	14	Same as S-6, Hard with frequent, dry, light gray, medium gravel-sized clay balls, trace lignite (CL) Pocket penetrometer: 4.25tsf; Pocket torvane > 9.0tsf	
			S	13		40.0 - 42.0	8	14	19	25	24	Same as S-6, Hard with frequent, dry, light gray, medium gravel-sized clay balls and lens < 0.25" thick of gray, fine Sand and Silt, trace lignite (CL) Pocket penetrometer: 4.0tsf; Pocket torvane > 9.0tsf	
			S	14		42.0 - 42.4	100/5"				5	42 -15.9 Damp, hard, mottled gray and olive, Silty CLAY, frequent, dry, light gray or reddish gray, medium gravel-sized clay balls, trace fine Sand, trace lignite (CH)	
45			S	15		44.0 - 46.0	10	14	19	29	24	Same as S-14 (CH) Pocket penetrometer: 4.25tsf; Pocket torvane > 9.0tsf	
			S	16		46.0 - 48.0	10	17	23	35	10	Same as S-14, Hard with dry, light gray, medium clay balls, trace lignite (CH)	
			S	17		48.0 - 49.5	9	14	80	100/0"	18	48 -21.9 Damp, hard, mottled brown and pinkish gray, Silty CLAY, some fine to medium Sand (CL) Pocket penetrometer: 2.5tsf; Pocket torvane: 5.0tsf	
50			S	18		50.0 - 52.0	10	15	20	25	24	Same as S-17 with frequent, dry, light gray, fine to medium gravel-sized clay balls, trace lignite (CL) Pocket penetrometer: 4.5tsf; Pocket torvane > 9.0tsf	
			S	19		52.0 - 54.0	9	12	19	17	12	Same as S-17 with frequent, dry, light gray, fine to medium gravel-sized clay balls, trace lignite (CL) Pocket penetrometer: 4.0tsf; Pocket torvane > 9.0tsf	
			S	20		54.0 - 56.0	12	26	22	27	24	Same as S-17 with frequent, dry, light gray, fine to medium gravel-sized clay balls, trace lignite (CL)	
55			S	21		56.0 - 58.0	17	20	25	26	18	Same as S-17 with frequent, light gray, medium gravel-sized clay balls and frequent 0.5" interbedded layers	



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Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-3**

SHEET NUMBER: **4** of **5**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**


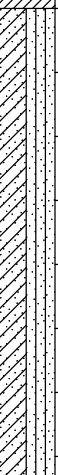

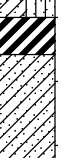
LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
60			S	22	58.0 - 59.8	11	22	52	100/3"	21	of fine to medium Sand in bottom 12", trace lignite (CL)		
			S	23	60.0 - 62.0	14	15	17	19	24	Same as S-17 with frequent, light gray, coarse gravel-sized clay balls, trace lignite (CL)		
			S	24	62.0 - 63.9	18	56	86	100/5"	23	62 -35.9	Moist, very dense, gray, fine to medium SAND, some silty Clay and a 6" layer of brown, organic Silt at 14" from top of spoon (SC-SM)	
65			S	25	64.0 - 66.0	7	20	27	53	16	Moist, very dense, gray, fine to coarse SAND varved with clayey Silt in frequent 1" layers, trace lignite (SC-SM)		
			S	26	66.0 - 68.0	6	4	10	43	12	Same as S-25 with 0.25-1.0" layers of silty Clay at 4" spacing (SC-SM)		
			S	27	68.0 - 69.4	24	56	100/5"		14	Same as S-25 with 0.25-1.0" layers of silty Clay at 4" spacing (SC-SM)		
70			S	28	70.0 - 71.3	19	53	100/4"		12	Same as S-25 with 0.5-2.0" layers of silty Clay at 3" spacing (SC-SM)		
			S	29	72.0 - 73.0	28	100/6"			12	72 -45.9 72.58	S-29A (Top 7"): Damp, hard, dark gray, Silty CLAY (CH)	
			S	30	74.0 - 76.0	12	20	30	33	22	-46.48	S-29B (Bottom 5"): Moist, very dense, gray, fine to coarse SAND, some silty Clay (SC)	
75			S	31	76.0 - 78.0	16	24	37	60	22	74.83 -48.73	S-30A (Top 10"): Same as S-29B (SC)	
			S	31	76.0 - 78.0	16	24	37	60	22	76 -49.9	S-30B (Bottom 12"): Damp, hard, dark gray, Silty CLAY, little fine to medium Sand, trace lignite (CH)	
												Moist, very dense, gray, fine to coarse SAND varved with dark gray, silty Clay in occasional 5-6" layers (SC)	

BORING LOG

(continued)

BORING NUMBER: **RD-3**

SHEET NUMBER: 5 of 5

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Riverdale, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]

BORING LOG

BORING NUMBER: RD-3A

SHEET NUMBER: 1 of 3

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Riverdale, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

DRILLING METHOD: Mud rotary wash using revert

RIG TYPE: Truck mounted Diedrich D50 with safety hammer

LOCATION: Southeast corner of Riverdale Park

COORD. N: 471,826.0 E: 1,333,716.0






STN. NO.: OFFSET:

SURFACE ELEV.: 26.2 feet

DATUM: **NAD 83/91 and NAVD 88**

START DATE: 8/23/07 TIME: 12:00 pm

FINISH DATE: 8/24/07 TIME: 2:30 pm

Type/Symbol I.D. O.D. Length Hammer Wt. Hammer Fall	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
		S 	U 	P 	G 	C 	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
				2.87"							
				3"			8/24/07	12:30 pm	10.0	0.0	55.0
				36"							
			Drill Rod Size								
			I.D. (O.D.)								

[illegible]



Parsons
Brinckerhoff
Quade &
Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-3A**

SHEET NUMBER: 2 of 3

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			



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Douglas, Inc.

BORING LOG

(continued)

BORING NUMBER: **RD-3A**

SHEET NUMBER: **3** of **3**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**




LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
												Depth Elev.	
													Attempted to retrieve second pitcher sample because of low recovery in first pitcher sample.
40													
			P	3		42.0 - 45.0						30	42 -15.8 Damp, hard, mottled gray and olive, Silty CLAY, frequent, dry, light gray or reddish gray, medium gravel-sized clay balls, trace fine Sand, trace lignite (CH)
45													
50													
			P	4		52.0 - 55.0						28	52 -25.8 Damp, hard, mottled brown and pinkish gray, Silty CLAY, frequent, dry, light gray, fine to medium gravel-sized clay balls, some fine to medium Sand, trace lignite (CL)
55													Bottom of boring at 55'. Boring tremie grouted with cement grout upon completion. Site restored with seed and straw.



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BORING LOG

BORING NUMBER: **RD-4**
SHEET NUMBER: **1** of **4**
PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**
LOCATION: **Riverdale, Maryland**
CLIENT: **Maryland Transit Administration (MTA)**
CONTRACTOR: **E2CR, Inc.**
DRILLER: **J. Sies**
INSPECTOR: **C. Nicholson**
DRILLING METHOD: **Hollow stem auger**
RIG TYPE: **Truck mounted Diedrich D50 with safety hammer**
LOCATION: **In median on East-West Hwy east of Anacostia River**
COORD. N: **471,421.0** E: **1,334,287.0**
STN. NO.: OFFSET:
SURFACE ELEV.: **38.9 feet**
DATUM: **NAD 83/91 and NAVD 88**
START DATE: **8/1/07** TIME: **9:10 am**
FINISH DATE: **8/2/07** TIME: **11:00 am**

Type/Symbol	Casing	Split Spoon	Shelby Tube	Pitcher	Grab	Core Barrel	GROUNDWATER DATA				
I.D.		S ■ 1.375"	U □	P ▢	G ☒	C ▢	Date	Time	Water Depth (ft)	Casing Depth (ft)	Hole Depth (ft)
O.D.		2"					8/1/07	12:30 pm	24.0	24.0	24.0
Length		24"					8/2/07	9:10 am	14.3	48.0	48.0
Hammer Wt.		140lbs	Drill Rod Size								
Hammer Fall		30"	I.D. (O.D.)								

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
5			S	1		0.0 - 2.0	8	33	40	25	14	0-0.25' Dry, hard, dark brown, SILT, trace Sand, trace roots (ML) (Topsoil)	
			S	2		2.0 - 4.0	16	24	26	17	3	Dry, hard, light brown, SILT, some fine to medium Sand, trace fine to coarse subrounded Gravel, trace friable red pieces, trace roots (ML) (Fill)	
			S	3		4.0 - 6.0	9	13	18	20	16	Dry, dense, brown, fine to medium SAND, little Silt, trace fine to coarse subrounded Gravel, trace roots (SM) (Fill)	
			S	4		6.0 - 8.0	10	9	11	15	16	Dry, hard, mottled light brown, red, orange, and gray, CLAY & SILT, some fine Sand, trace fine Gravel (CL) (Fill)	
			S	5		8.0 - 10.0	6	17	30	20	15	Same as S-3, very stiff (CL) (Fill)	
			S	6		10.0 - 12.0	6	4	3	2	16	S-5A (Top 3"): Same as S-3 (CL) (Fill) S-5B (Bottom 12"): Damp, hard, dark brown, Clayey SILT, some fine to coarse Sand, trace fine to coarse subangular Gravel (ML)	
			S	7		12.0 - 14.0	8	18	23	30	18	Moist, loose, brown in top 8" and gray in bottom 8", fine to coarse SAND, some silty Clay (SC)	
			S	8		14.0 - 16.0	23	15	12	7	14	Same as S-6, dense, gray in top 9" and brown in bottom 9", some fine to coarse subangular Gravel (SC)	



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BORING LOG

(continued)

BORING NUMBER: **RD-4**

SHEET NUMBER: 2 of 4

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	Depth Elev.	
			S	9		16.0 - 18.0	7	8	9	9	17		Same as S-6, medium dense, brown (SC)
			S	10		18.0 - 20.0	4	4	4	8	14	18	Moist, medium stiff, brown, CLAY & SILT and fine Sand (CL)
												20.9	
20			S	11		20.0 - 22.0	4	6	9	14	20		Same as S-10, stiff (CL)
			S	12		22.0 - 24.0	4	4	6	9	18		Same as S-10; occasional fissures (CL)
			S	13		24.0 - 26.0	5	7	9	15	24		24.0': Water observed during drilling.
25													Same as S-10, very stiff (CL)
			S	14		26.0 - 28.0	4	9	16	16	18		Same as S-10, very stiff (CL)
			S	15		28.0 - 30.0	3	5	9	11	24		Same as S-10, stiff, trace coarse subrounded Gravel (CL)
30			S	16		30.0 - 32.0	5	11	10	15	21		Same as S-10, very stiff (CL)
			S	17		32.0 - 34.0	2	3	4	5	15		Same as S-10 (CL) Pocket penetrometer: 4.25tsf, Pocket torvane: 3.5-5.5tsf
35			S	18		34.0 - 36.0	14	11	16	18	23		Same as S-10, very stiff (CL) Pocket penetrometer: 4.5tsf, Pocket torvane: 3.5-5.5tsf



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BORING LOG

(continued)

BORING NUMBER: **RD-4**

SHEET NUMBER: **3** of **4**

PROJECT NUMBER: **18005 A**

PROJECT: **Purple Line**

LOCATION: **Riverdale, Maryland**

CLIENT: **Maryland Transit Administration (MTA)**

CONTRACTOR: **E2CR, Inc.**

DRILLER: **J. Sies**

INSPECTOR: **C. Nicholson**

DEPTH (feet)	GRAPHIC LOG	CASING (Blows/ft)	SAMPLE				SOIL (Blows/6 in.)					FIELD CLASSIFICATION AND REMARKS	
			TYPE	NUMBER	SYMBOL	DEPTH (feet)	0/6	6/12	12/18	18/24	REC. (in.)		
							CORING						
							RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
40													

BORING LOG

(continued)

BORING NUMBER: **RD-4**

SHEET NUMBER: 4 of 4

PROJECT NUMBER: 18005 A

PROJECT: Purple Line

LOCATION: Riverdale, Maryland

CLIENT: Maryland Transit Administration (MTA)

CONTRACTOR: E2CR, Inc.

DRILLER: J. Sies

INSPECTOR: C. Nicholson

[illegible]



Appendix T

Riverdale Groundwater Observation

Well Construction Logs and Readings

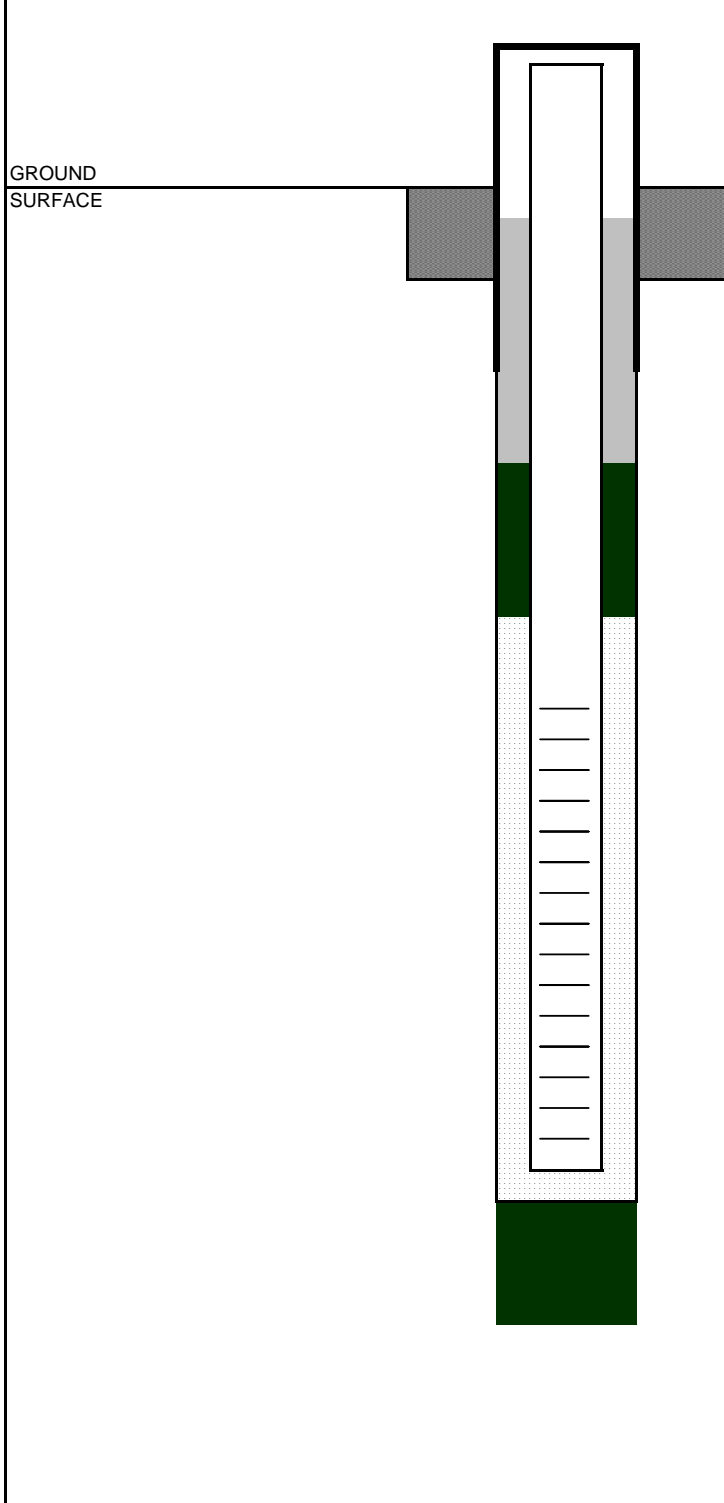


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100 S. Charles Street
Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	RD-2A
Project Name:	Purple Line	Driller:	J. Sies	Date Installed:	8/16/2007
Project Location:	Riverdale, Maryland	Ground EL:	(feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	(feet)	Page:	1 of 1

	SURFACE SEAL: (Thickness & Type)	cement grout
	BACKFILL MATERIAL: (Type)	cement grout
	TOP OF SEAL:	(feet) 50.0'
	SEAL CONSTRUCTION: (Thickness & Type)	bentonite pellets
	TOP OF SANDPACK:	(feet) 52.0'
	RISER CONSTRUCTION: (Type, Diameter & Material)	2" Ø pvc
	TOP OF SCREEN:	(feet) 56.0'
	SANDPACK TYPE:	#2 silica sand
	SCREEN MATERIAL: (Type, Slot, Diameter & Material)	2" Ø pvc with 0.02" machine slots
	BOTTOM OF SCREEN:	(feet) 66.0'
BOTTOM OF BOREHOLE:	(feet) 68.0'	
BOREHOLE DIAMETER:	(inch) 5"	

Remarks:



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Tower 1, Tenth Floor
Baltimore, MD 21201-2727
(410) 727-5050
Fax: (410) 727-4608

Monitoring Well Installation Log

Client:	Maryland Transit Admin.	Contractor:	E2CR, Inc	Boring/Well No.:	RD-4
Project Name:	Purple Line	Driller:	J. Sies	Date Installed:	8/2/2007
Project Location:	Riverdale, Maryland	Ground EL:	(feet)	Logged By:	C. Nicholson
Project Number:	18005A	Riser EL:	(feet)	Page:	1 of 1

	<p>SURFACE SEAL: <u>cement grout and quikrete</u> (Thickness & Type)</p> <p>BACKFILL MATERIAL: <u>cement grout</u> (Type)</p> <p>TOP OF SEAL: <u>(feet) 35.916'</u></p> <p>SEAL CONSTRUCTION: <u>bentonite pellets</u> (Thickness & Type)</p> <p>TOP OF SANDPACK: <u>(feet) 38.16'</u></p> <p>RISER CONSTRUCTION: <u>2" Ø pvc</u> (Type, Diameter & Material)</p> <p>TOP OF SCREEN: <u>(feet) 40.33'</u></p> <p>SANDPACK TYPE: <u>#2 silica sand</u></p> <p>SCREEN MATERIAL: <u>2" Ø pvc with 0.02" machine slots</u> (Type, Slot, Diameter & Material)</p> <p>BOTTOM OF SCREEN: <u>(feet) 50.33'</u></p> <p>BOTTOM OF BOREHOLE: <u>(feet) 70.0'</u></p> <p>BOREHOLE DIAMETER: <u>(inch) 8"</u></p>
--	---

Remarks: Seven bags bentonite plug used to seal borehole 53.5'-70.0'. One and a half bags #2 silica sand from 50.33' to 53.5'



Appendix U

Riverdale Soil Laboratory Test Data



LOGS OF PITCHER SAMPLES



The Robert B. Balter Company
Geotechnical and Environmental Engineers
Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
www.balterco.com

PITCHER SAMPLE LOG

BORING RD-2A: P-1

@ 32 - 35'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION Riverdale, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 8/15/07

REPORTED RECOVERY: 22 inches

DATE CUT & LOGGED: 9/15/07

MEASURED RECOVERY: 20 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
33				Filter Sand. (Packing Material)	0.5	
33.3						
34						
			CH	Moist, Mottled Red Brown and Gray Stiff to Very Soft CLAY. Material increased in softness towards the top.		Residual Direct Shear @ 10,20,40 psi.
						1-D Swell Test. (ASTM D4546)
34.8					3.83	
35				Cut and Discard.		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-1 PURPLE LINE RIVERDALE SECTION.GPJ ROBERT B BALTER.GDT 12/19/07



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Geotechnical and Environmental Engineers
Materials and Construction Inspection and Testing
Telephone No. (410) 363-1555
www.balterco.com

PITCHER SAMPLE LOG

BORING RD-2A: P-2

@ 49 - 52'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION Riverdale, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 8/15/07

REPORTED RECOVERY: 27 inches

DATE CUT & LOGGED: 9/28/07

MEASURED RECOVERY: 25 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
50	50.0			Filter Sand (Packing Material)		
51			CH	Moist, Mottled Red and Brown, Hard CLAY.		CIUC @ 14 psi CIUC @ 28 psi CIUC @ 56psi
52	51.9			Cut and Discarded. Possible drilling disturbance.	4.5+	

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-1 PURPLE LINE RIVERDALE SECTION.GPJ ROBERT B BALTER.GDT 12/19/07



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PITCHER SAMPLE LOG

BORING RD-3A: P-2

@ 35 - 38'

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION Riverdale, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 8/24/07

REPORTED RECOVERY: 16 inches

DATE CUT & LOGGED: 9/13/07

MEASURED RECOVERY: 16 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
36				Filter Sand. (Packing Material)		
36.5						
37			CL	Moist, Dark Gray, Very Soft CLAY. Possible cuttings from drilling action, clumps of stiff clay mixed with very soft, and mudlike clay. Disturbed.		Residual Direct Shear @ 12psi
37.3			CL	Moist, Dark Gray, Very Stiff, CLAY. Uniform and Homogeneous.		Residual Direct Shear @ 46 and 24 psi.
37.9						1-D Consolidation Test. (ASTM D2434)
38				Cut and Discard.	3.8	

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

PITCHER SAMPLE LOG 14961-1 PURPLE LINE RIVERDALE SECTION.GPJ ROBERT B BALTER.GDT 12/19/07

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION Riverdale, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 8/24/07


REPORTED RECOVERY: 36 inches

DATE CUT & LOGGED: 9/19/07

MEASURED RECOVERY: 30 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487)	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				SURFACE EL = Unknown		
				Filter Sand (Packing Material)		
42.5						
43						
						CIUC@54 PSI
			CH	Moist, Medium Stiff, Dark Gray CLAY with Silt and fine Sand, with trace medium to fine rock fragments.		CIUC @ 27PSI
44						Residual Direct Shear @ 13, 27, 54 psi
						CIUC @ 13PSI
					2.92	
44.9						
45				Cut and Discarded		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.

CLIENT E2CR

PROJECT NAME MTA-Purple Line

PROJECT LOCATION Riverdale, MD

PROJECT NUMBER 14961-0

DATE SAMPLED: 8/24/07

REPORTED RECOVERY: 29 inches

DATE CUT & LOGGED: 9/16/07

MEASURED RECOVERY: 28 inches

Logged By: Sam

Reviewer: Mr. Alberto Bartolome P.G.

TUBE DEPTH (ft)	STRATUM CHANGE DEPTH (ft)	GRAPHIC LOG	VISUAL USCS	VISUAL MATERIAL DESCRIPTION (ASTM D2487) SURFACE EL = Unknown	Avg. Pocket Penetrometer Values (tsf)	Lab Tests Performed
				Filter Sand (Packing Material)		
52.8						
53						
						CIUC @ 13PSI
						CIUC @ 32PSI
54				Moist, Medium Soft, Dark Gray CLAY with Silt lenses and traces of medium to fine gravel and rock fragments.		
						CIUC @ 64 PSI
						1-D Swell Test (ASTM D4546).
					2.5	
54.9						
55				Cut and Discard		

REMARKS: Pocket Penetrometers collected at Pitcher Sample tube cuts. Values represent an average of three equally spaced tests.



CLASSIFICATION TEST RESULTS



CHEMICAL TEST RESULTS

Prepared for:

Robert B. Balter Company
Bert Bartolome
18 Music Fair Road
Owings Mills, MD 21117

Certificate of Analysis

10/11/2007

MTA-Purple Line-Riverdale, MD

Sample Information

Sample Number 70002956-01
Sample ID RD-1 bulk
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 09/14/07 14:40
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	150	KS	10/03/2007 11:00	SM4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	10/05/2007 9:45	ASTM 1580
Sulfide	mg/Kg	2	<2	KS	09/27/2007 9:00	SM4500S2-C+E

Sample Information

Sample Number 70002956-02
Sample ID RD-1 S-11
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 09/14/07 14:40
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	10/03/2007 11:00	SM4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	10/05/2007 9:45	ASTM 1580
Sulfide	mg/Kg	2	<2	KS	09/27/2007 9:00	SM4500S2-C+E

Sample Information

Sample Number 70002956-03
Sample ID RD-2 S-16
Description

Matrix Soil
Sample Date/Time Not Provided
Sample Received 09/14/07 14:40
Sampler Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	10/03/2007 11:00	SM4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	10/05/2007 9:45	ASTM 1580
Sulfide	mg/Kg	2	<2	KS	09/27/2007 9:00	SM4500S2-C+E

This report may be reproduced only in its entirety. The results are valid only for the item(s) tested. They are provided to the client on a confidential basis and, to the extent of the law, will not be released to third parties without authorization.

Prepared for:

Robert B. Balter Company
Bert Bartolome
18 Music Fair Road
Owings Mills, MD 21117

MTA-Purple Line-Riverdale, MD

Certificate of Analysis

10/12/2007

Sample Information

Sample Number	70002956-04	Matrix	Soil
Sample ID	RD-3 S-9	Sample Date/Time	Not Provided
Description		Sample Received	09/14/07 14:40
		Sampler	Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	<60	KS	10/03/2007 11:00	SM4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	0.03	KS	10/11/2007 8:05	ASTM 1580
Sulfide	mg/Kg	2	<2	KS	09/27/2007 9:00	SM4500S2-C+E

Sample Information

Sample Number	70002956-05	Matrix	Soil
Sample ID	RD-4 S-4	Sample Date/Time	Not Provided
Description		Sample Received	09/14/07 14:40
		Sampler	Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	170	KS	10/03/2007 11:00	SM4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	10/05/2007 9:45	ASTM 1580
Sulfide	mg/Kg	2	<2	KS	09/27/2007 9:00	SM4500S2-C+E

Sample Information

Sample Number	70002956-06	Matrix	Soil
Sample ID	RD-4 S-10	Sample Date/Time	Not Provided
Description		Sample Received	09/14/07 14:40
		Sampler	Client

Analysis	Units	PQL	Results	Analyst	Date / Time Tested	Method
Chloride ISE-soil	mg/Kg	60	93	KS	10/03/2007 11:00	SM4500CI-D
Sulfate (gravimetric) In Soil	%	0.02	<0.02	KS	10/05/2007 9:45	ASTM 1580
Sulfide	mg/Kg	2	<2	KS	09/27/2007 9:00	SM4500S2-C+E

This report may be reproduced only in its entirety. The results are valid only for the item(s) tested. They are provided to the client on a confidential basis and, to the extent of the law, will not be released to third parties without authorization.

Prepared for:

Robert B. Balter Company
Bert Bartolome
18 Music Fair Road
Owings Mills, MD 21117

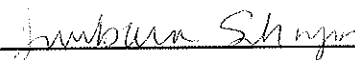
MTA-Purple Line-Riverdale, MD

Certificate of Analysis

10/11/2007



Beth Slowik - Quality Assurance Manager



Barbara Schroyer, Laboratory Director

This report may be reproduced only in its entirety. The results are valid only for the item(s) tested. They are provided to the client on a confidential basis and, to the extent of the law, will not be released to third parties without authorization.



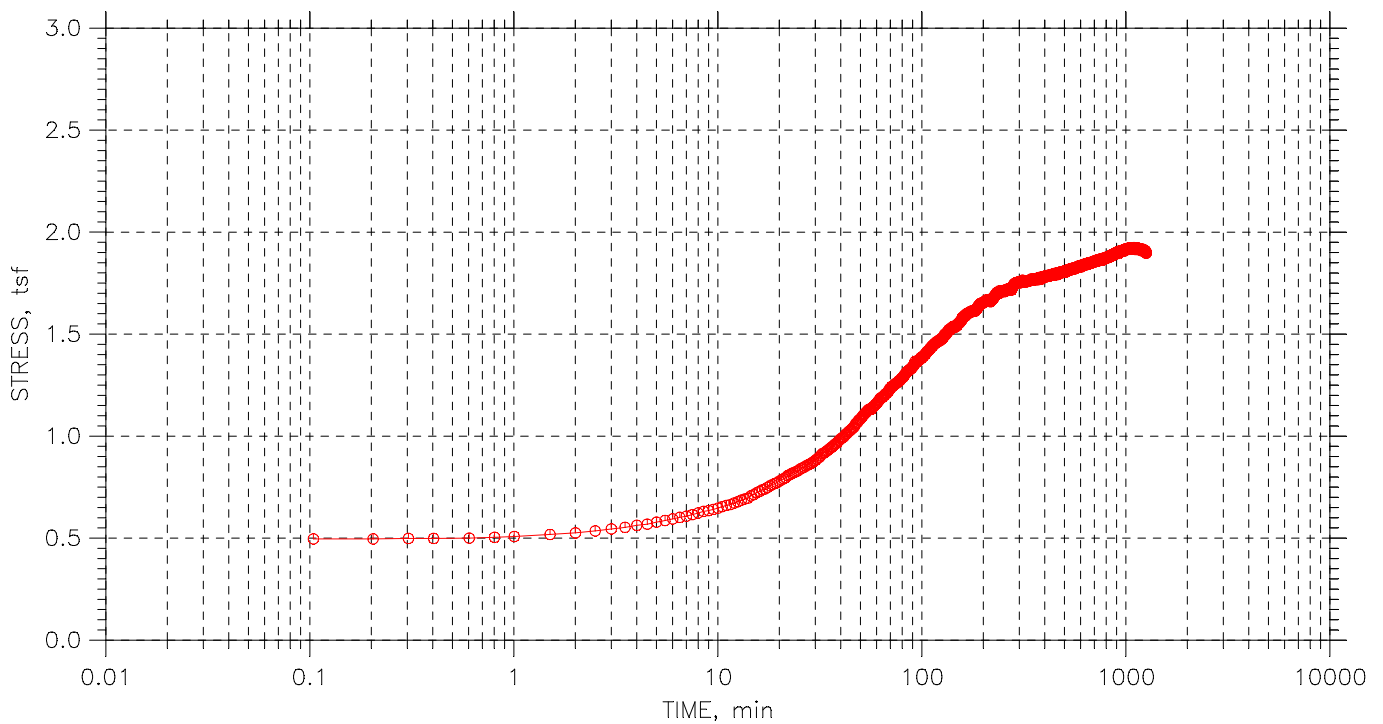
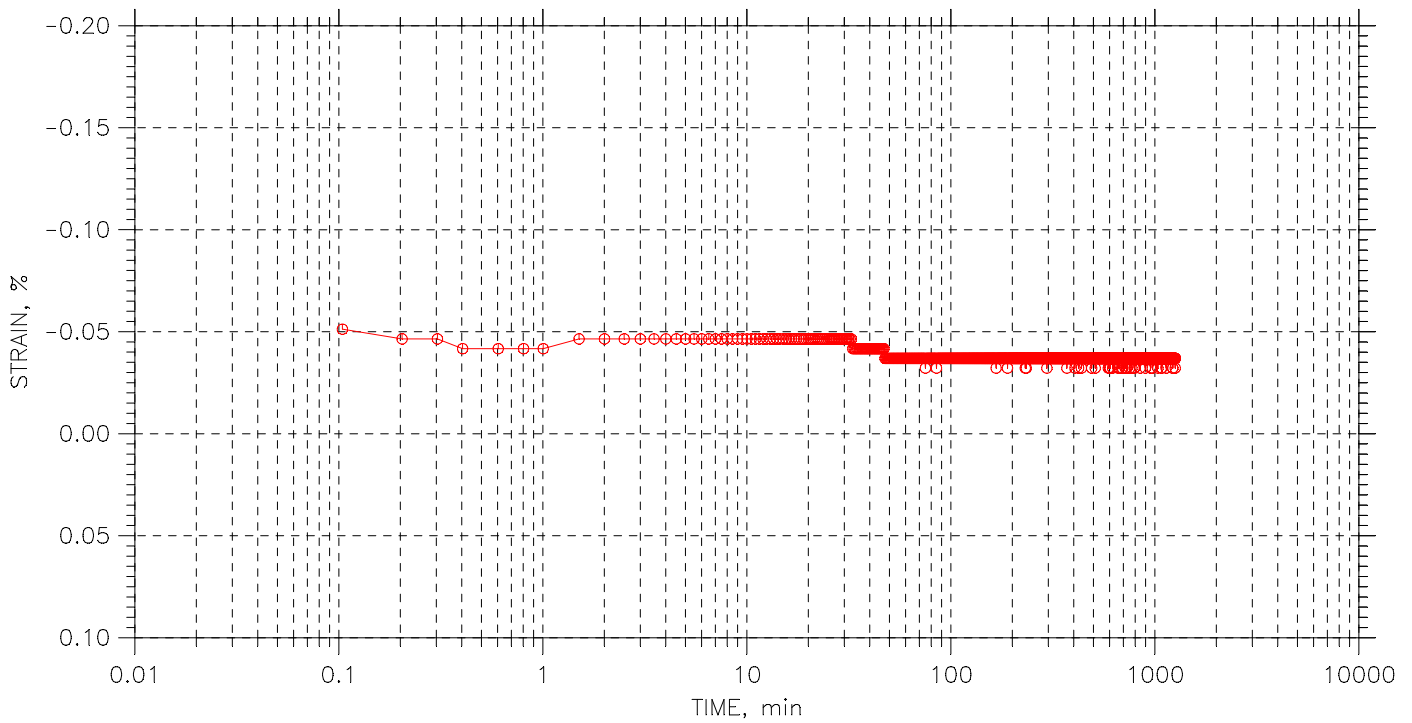
CONSOLIDATION TEST RESULTS


CONSOLIDATION TEST DATA

TIME CURVES

Constant Volume Step: 1 of 1

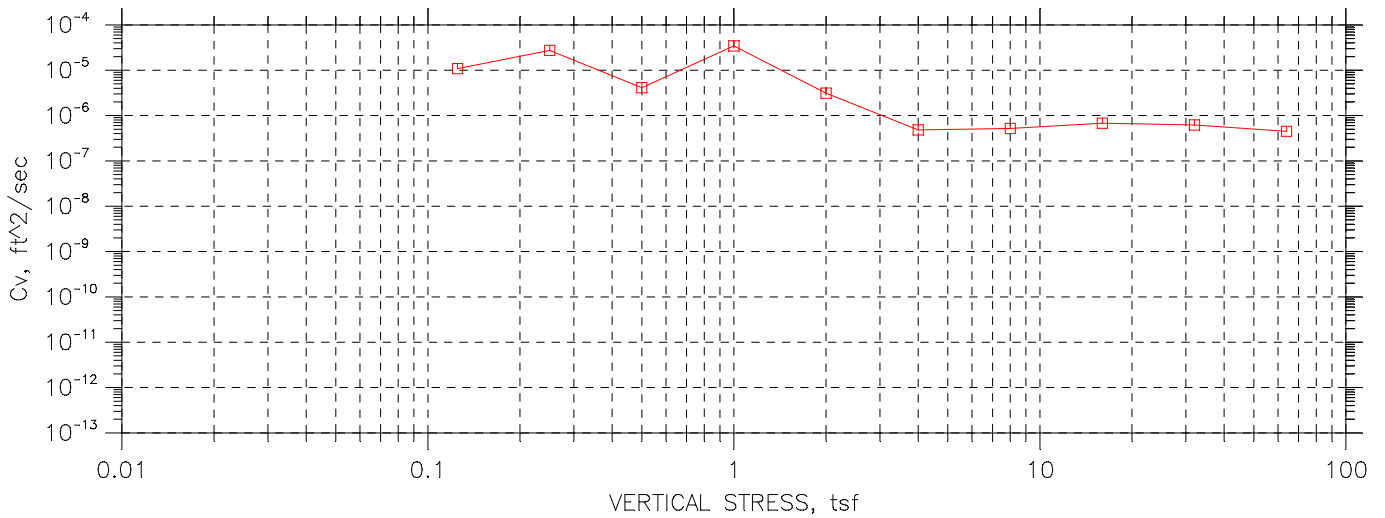
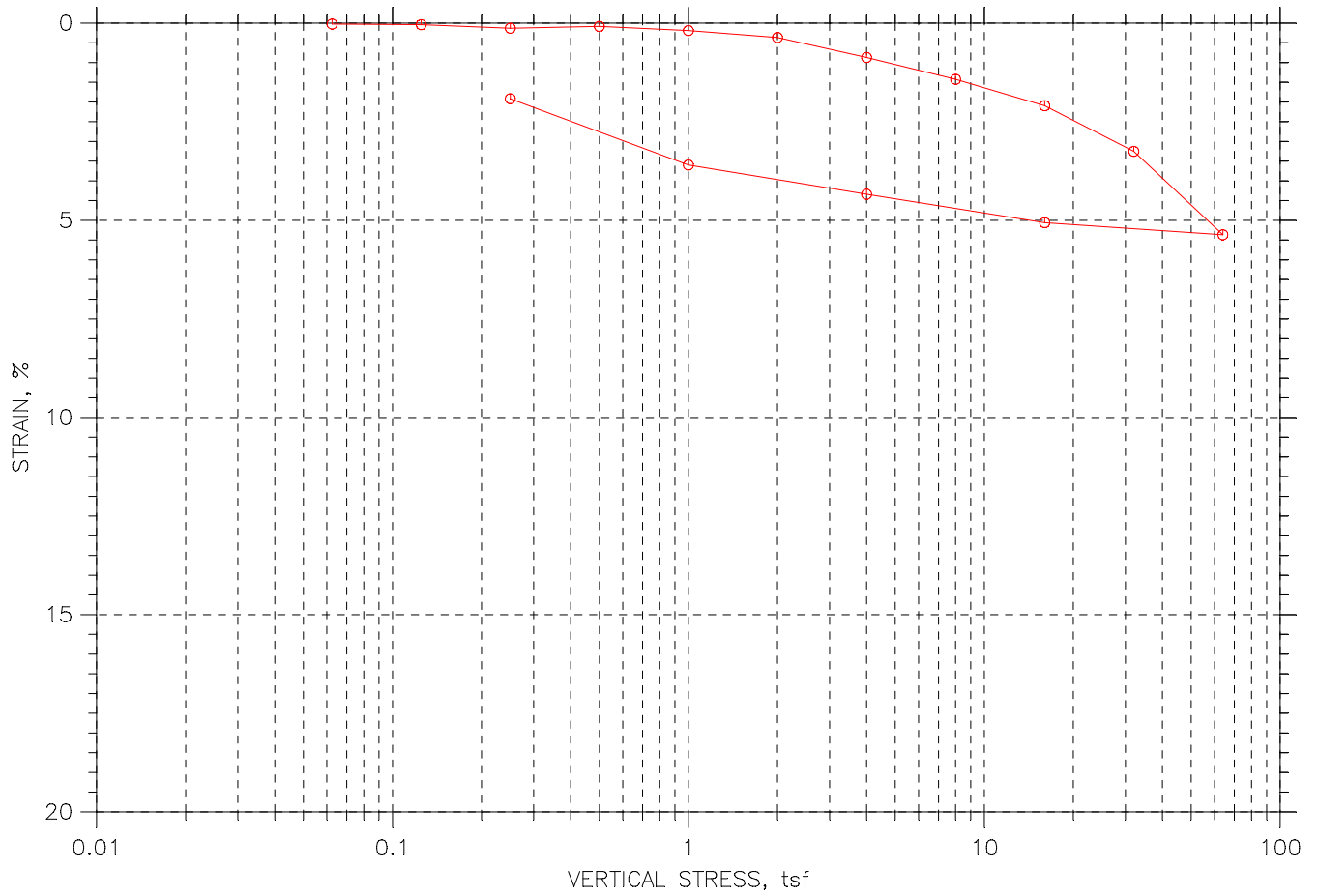
Stress: 0.5 tsf



	Project: Purple Line	Location:	Project No.: 14961-0
	Boring No.: RD-2A	Tested By: sam	Checked By: bert
	Sample No.: P-1	Test Date: 9/15/07	Depth: 34.75ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: VISUAL:Moist, Stiff, Mottled Red, Brown and Gray CLAY. (CL-CH)		
	Remarks: ASTM D4546. Pitcher Sample RD-2A, P-1 @ 32'-35'		

CONSOLIDATION TEST DATA

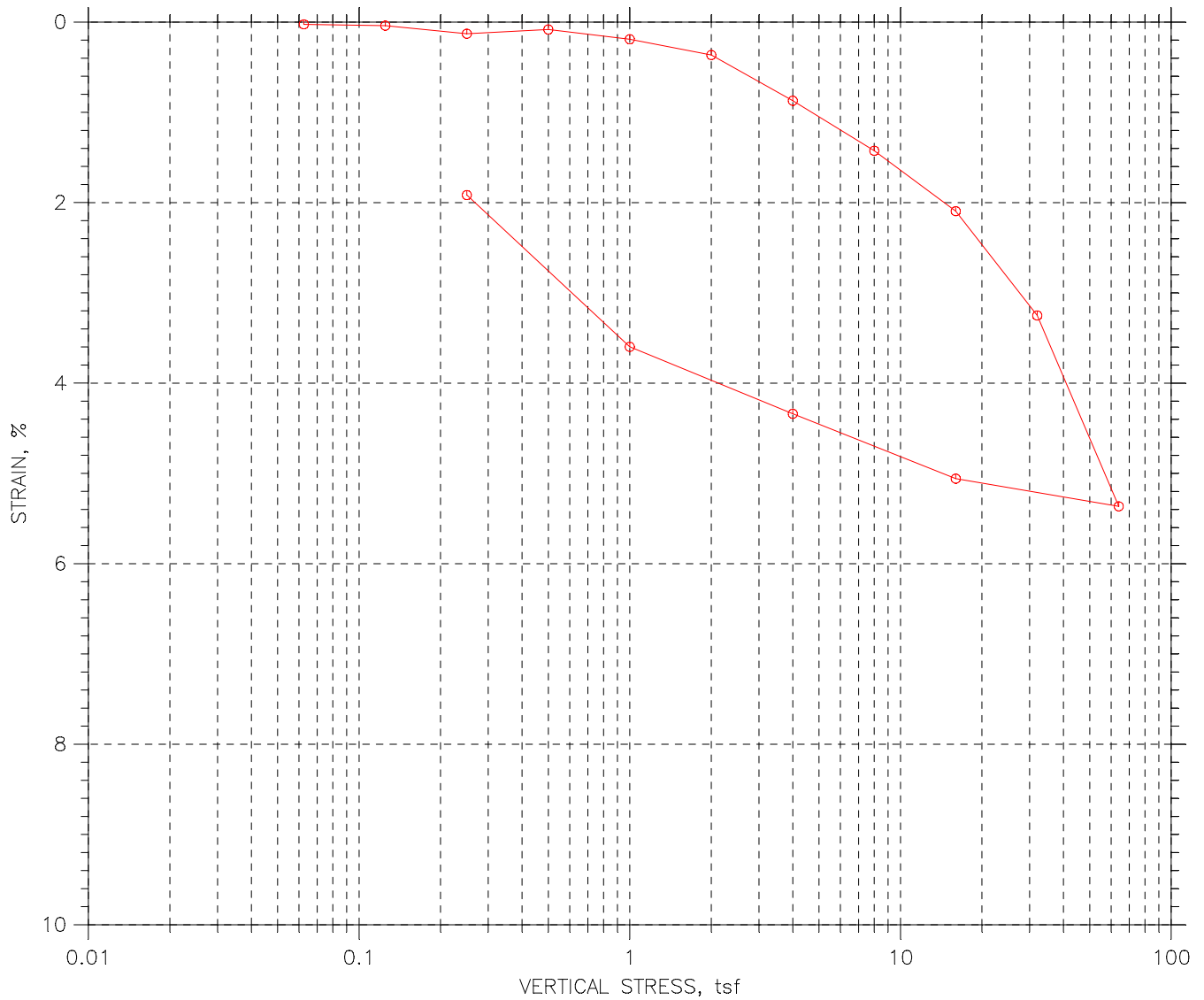
SUMMARY REPORT




Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
Boring No.: RD-3A	Tested By: sam	Checked By: bert
Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
Test No.: No. 1	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

SUMMARY REPORT

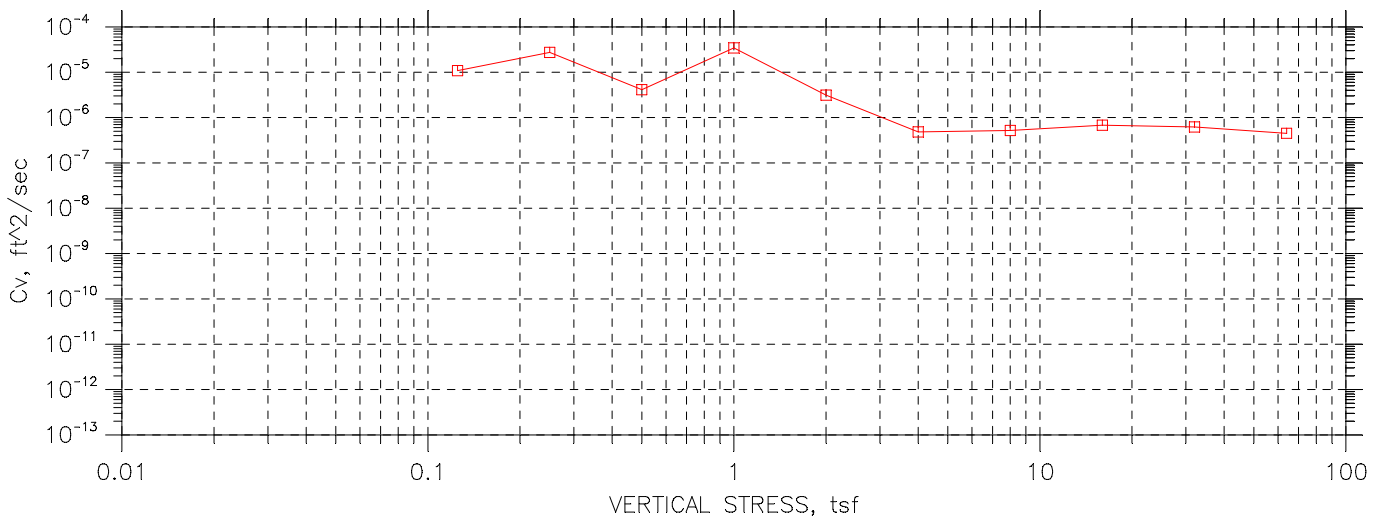
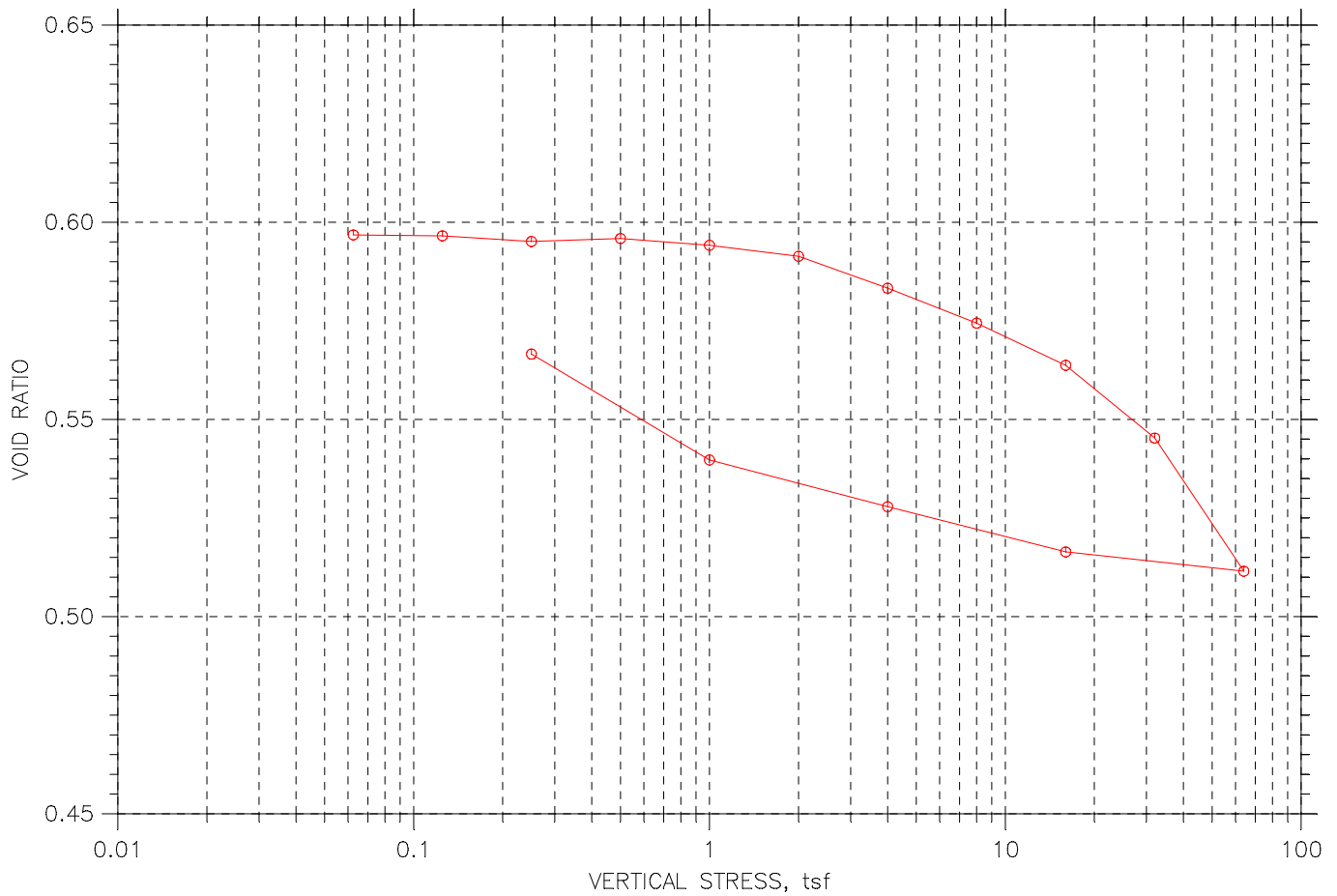


				Before Test	After Test	
Overburden Pressure: 0 tsf				Water Content, %	21.49	20.52
Preconsolidation Pressure: 0 tsf				Dry Unit Weight, pcf	105.5	107.6
Compression Index: 0				Saturation, %	97.16	97.81
Diameter: 1.987 in		Height: 1 in		Void Ratio	0.60	0.57
LL: 46	PL: 18	PI: 28	GS: 2.70			

	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

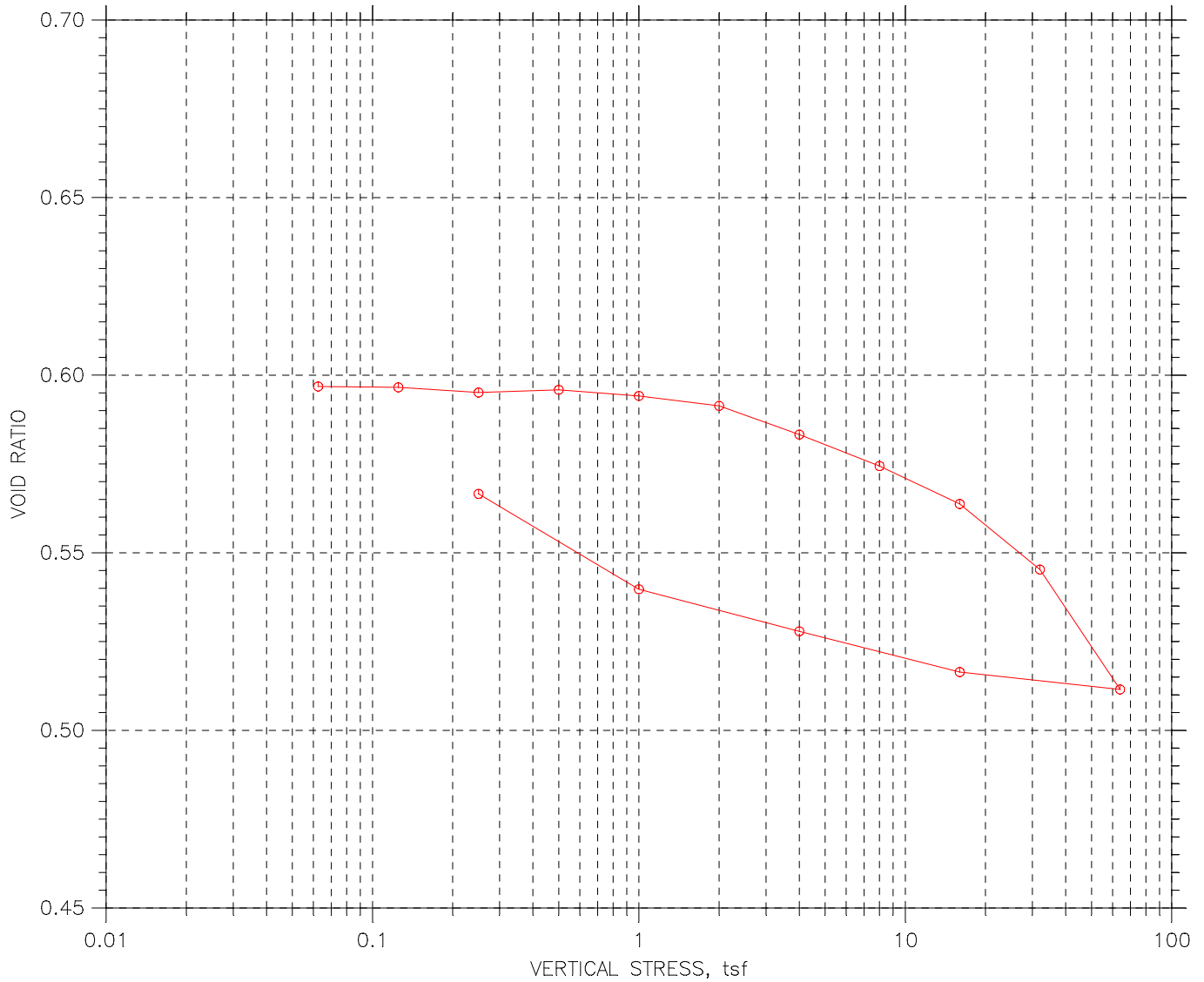
SUMMARY REPORT




	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

SUMMARY REPORT



				Before Test	After Test	
Overburden Pressure: 0 tsf				Water Content, %	21.49	20.52
Preconsolidation Pressure: 0 tsf				Dry Unit Weight, pcf	105.5	107.6
Compression Index: 0				Saturation, %	97.16	97.81
Diameter: 1.987 in		Height: 1 in		Void Ratio	0.60	0.57
LL: 46	PL: 18	PI: 28	GS: 2.70			

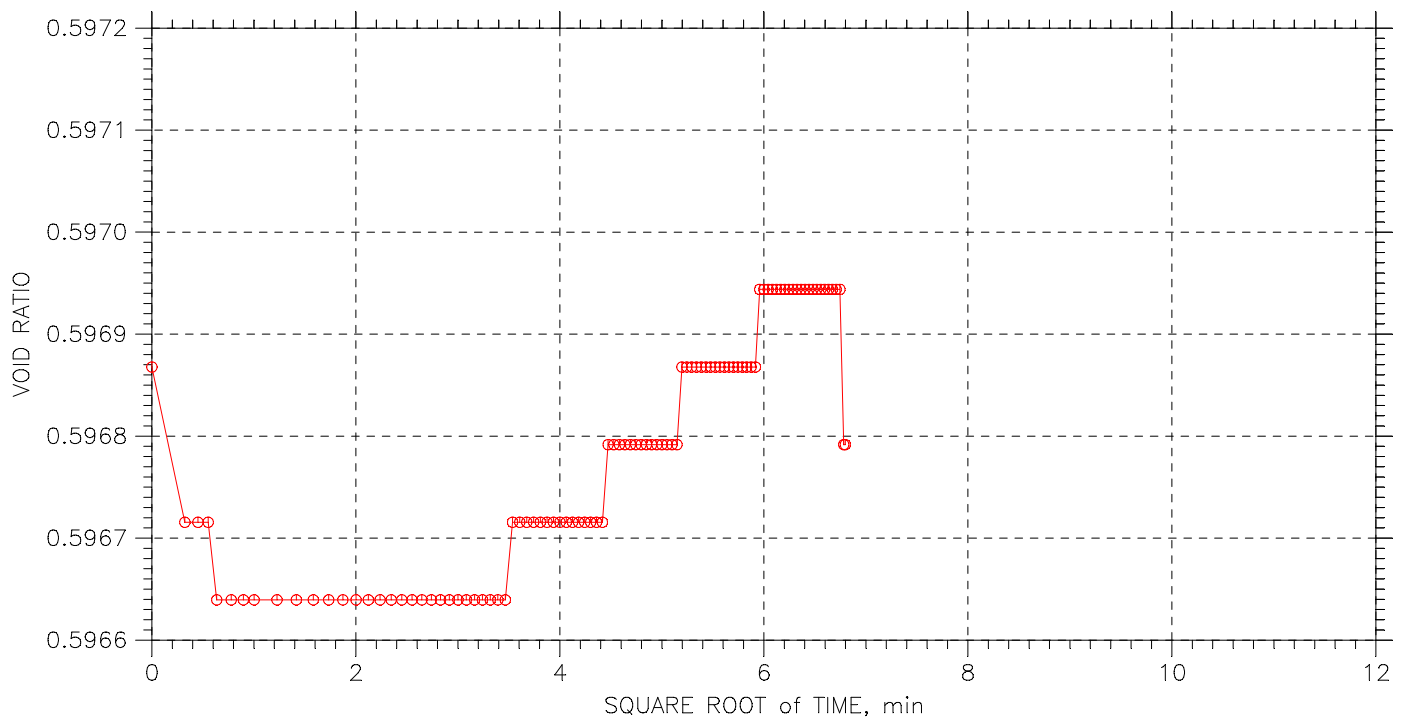
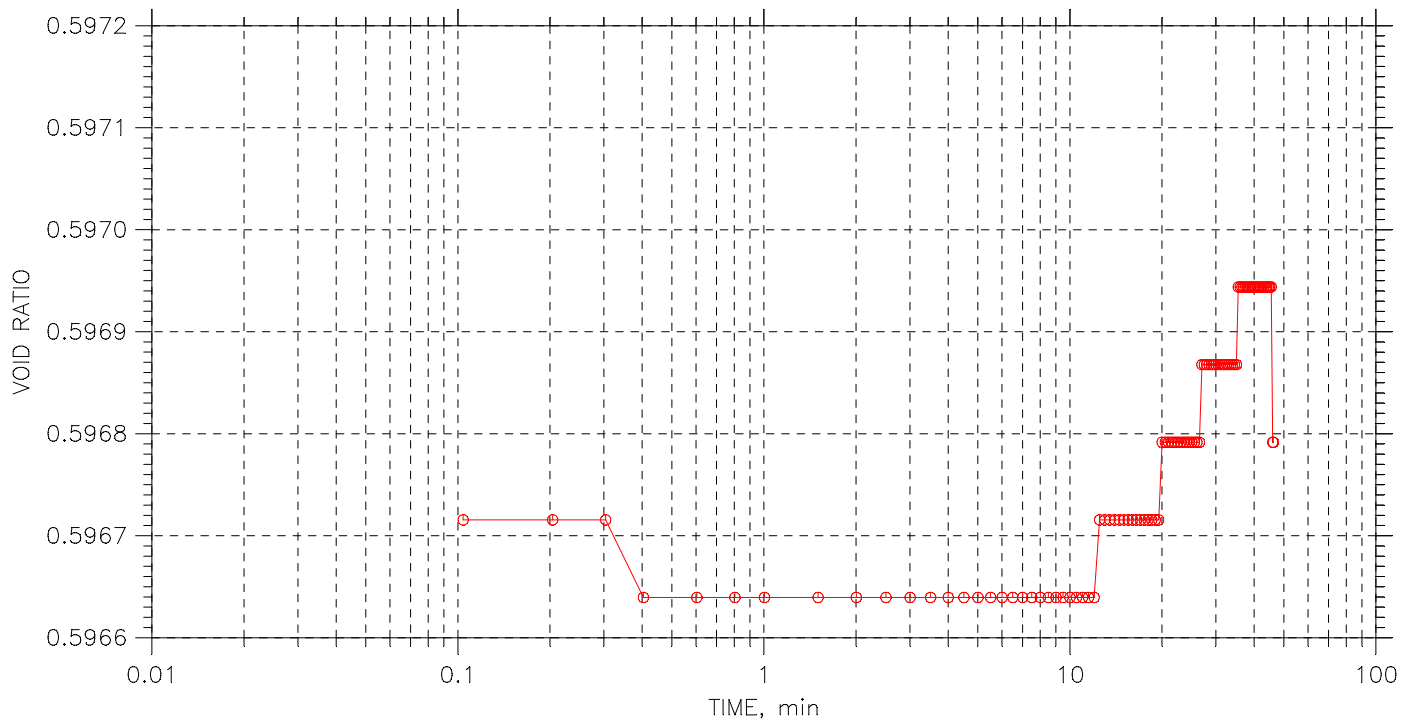
	Project: Purple Line		Location: Riverdale, MD		Project No.: 14961-0	
	Boring No.: RD-3A		Tested By: sam		Checked By: bert	
	Sample No.: P-2		Test Date: 9/13/07		Depth: 37.5ft	
	Test No.: No. 1		Sample Type: Pitcher		Elevation:	
	Description: Moist, Stiff, Dark Gray CLAY. (CL)					
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'					


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 15

Stress: 6.25e-002 tsf



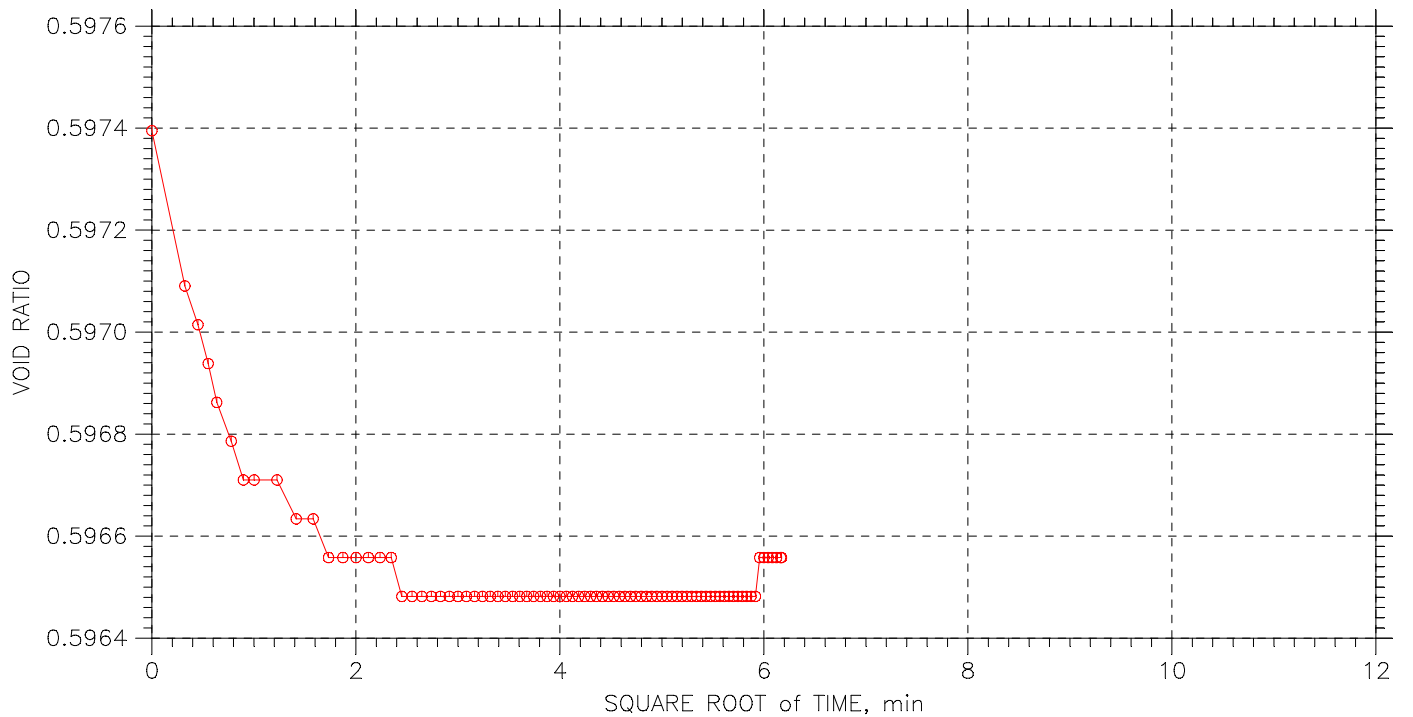
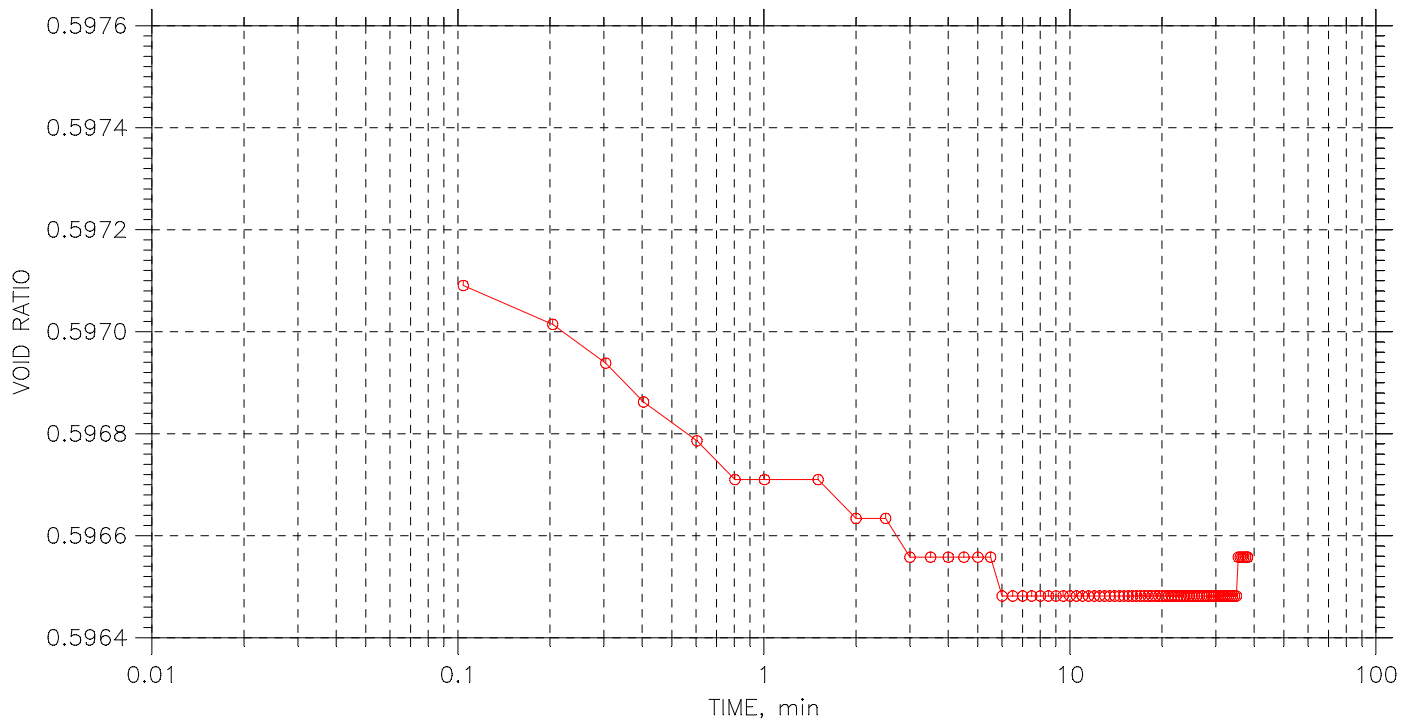
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 15

Stress: 0.125 tsf



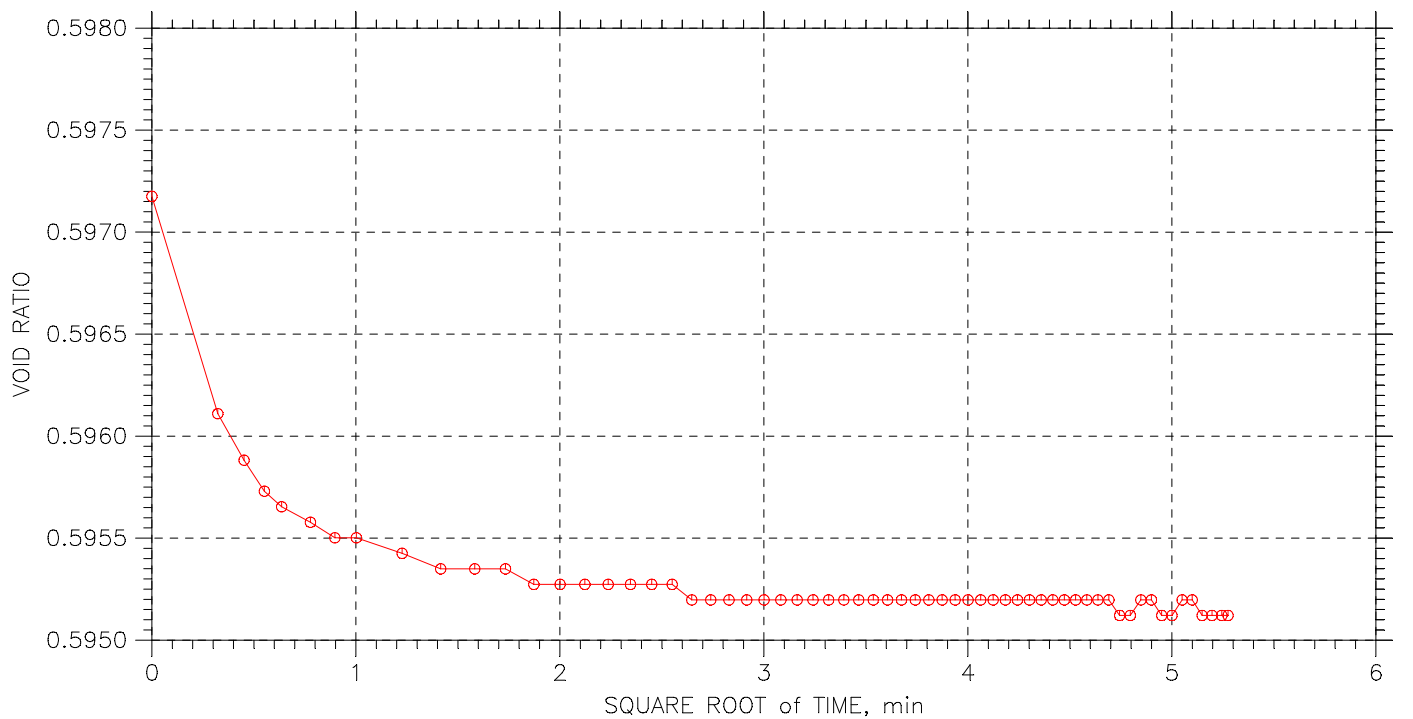
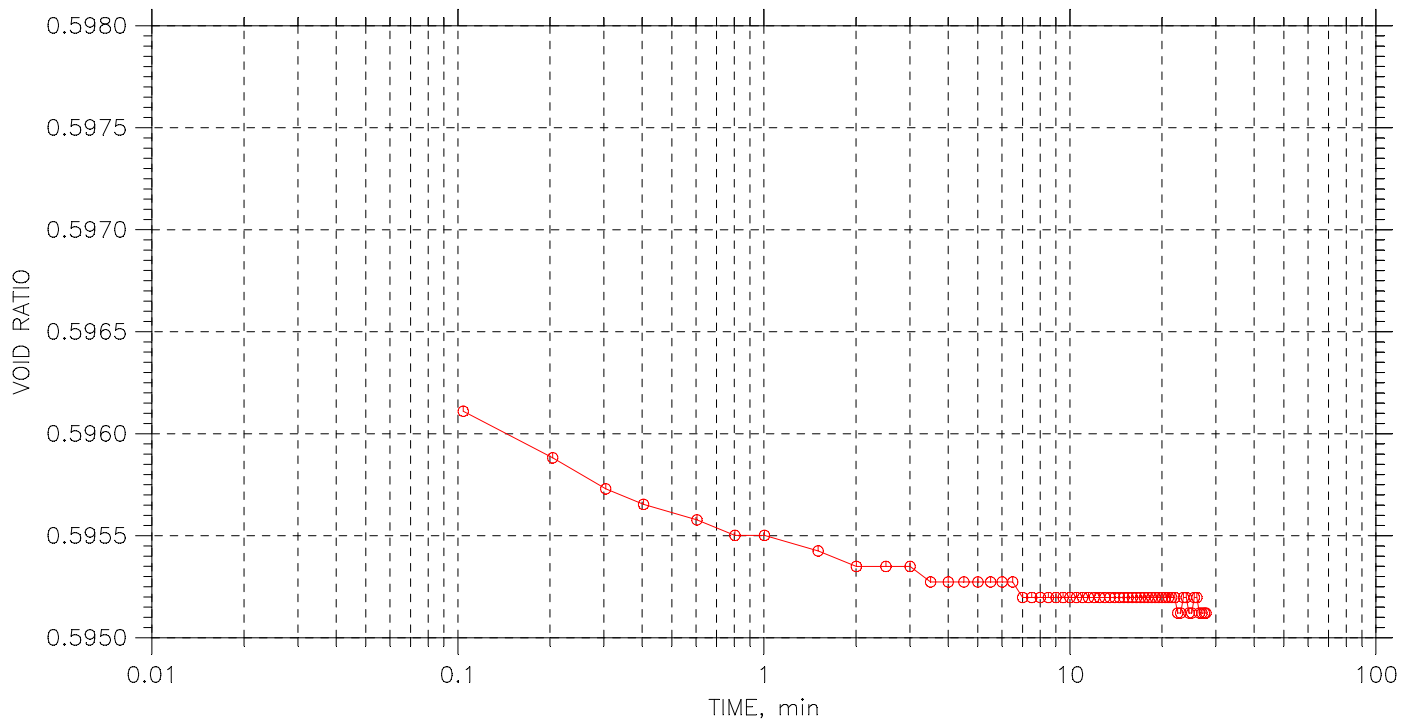
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 15

Stress: 0.25 tsf



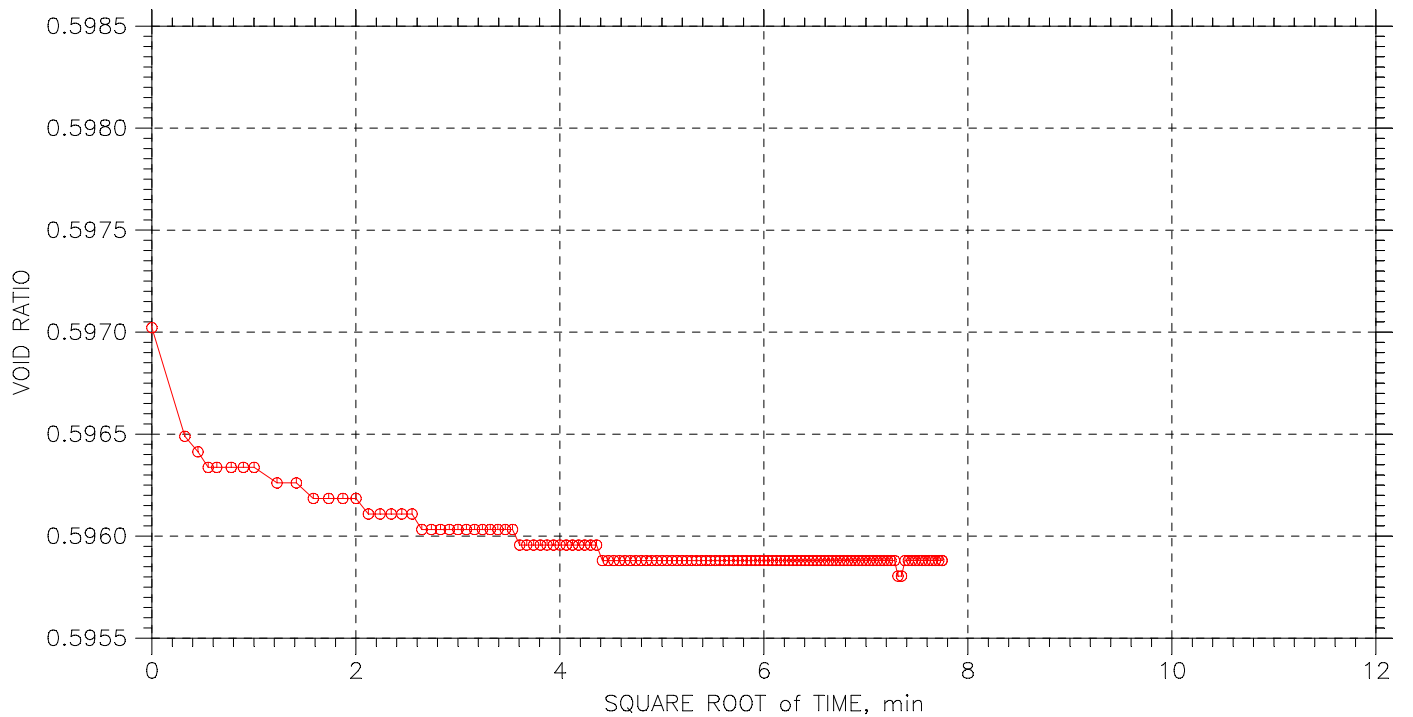
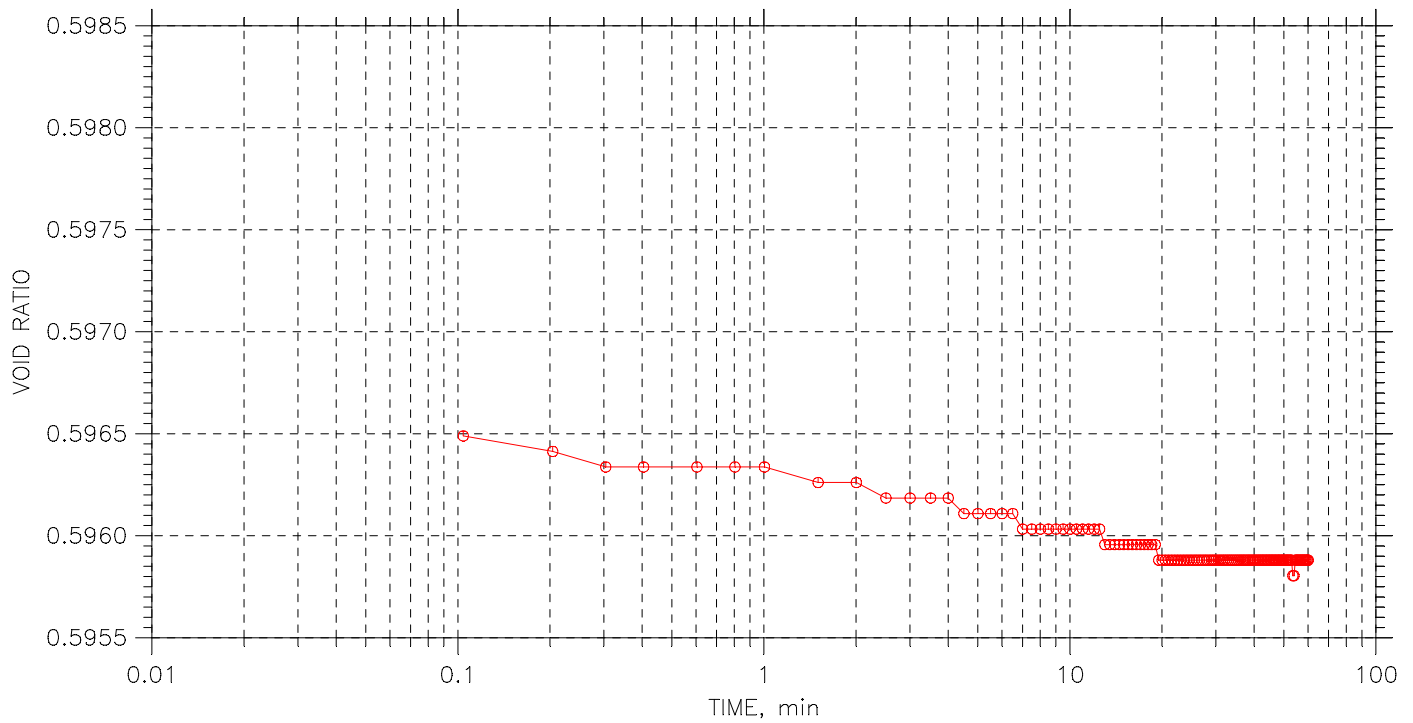
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 15

Stress: 0.5 tsf



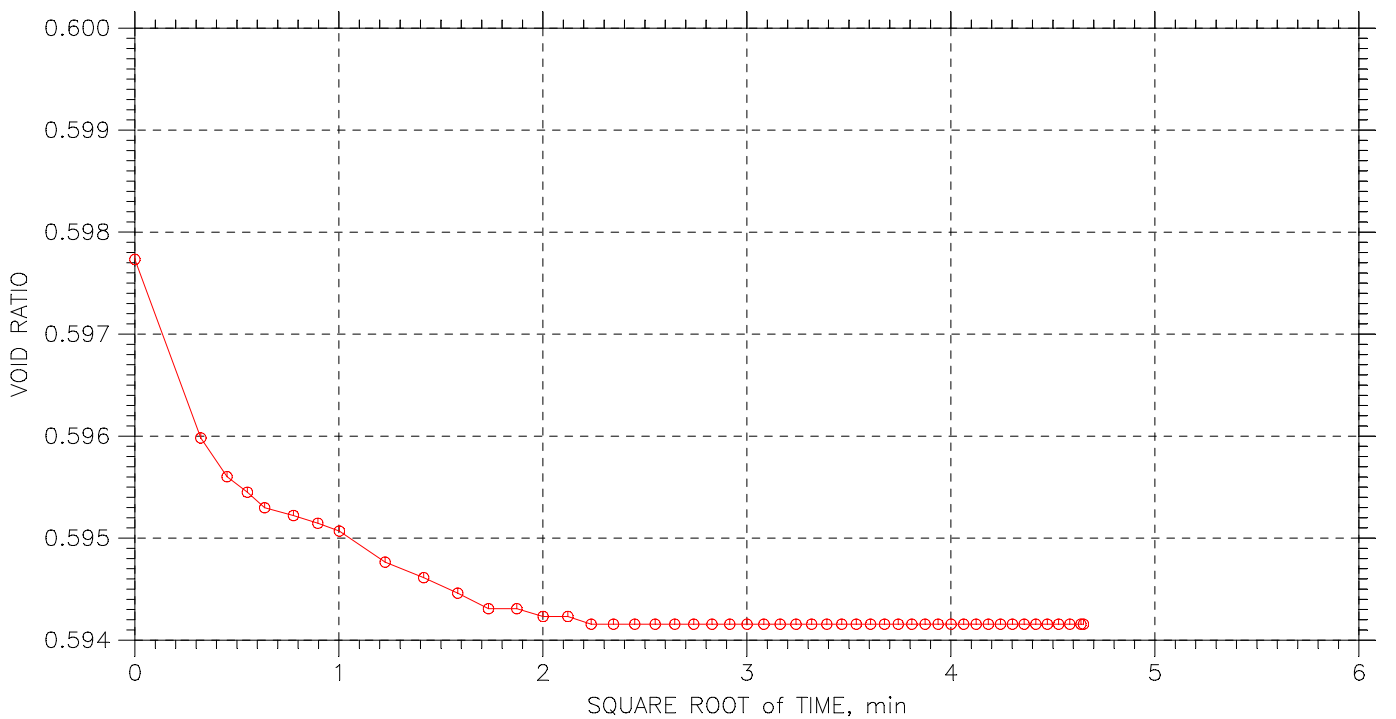
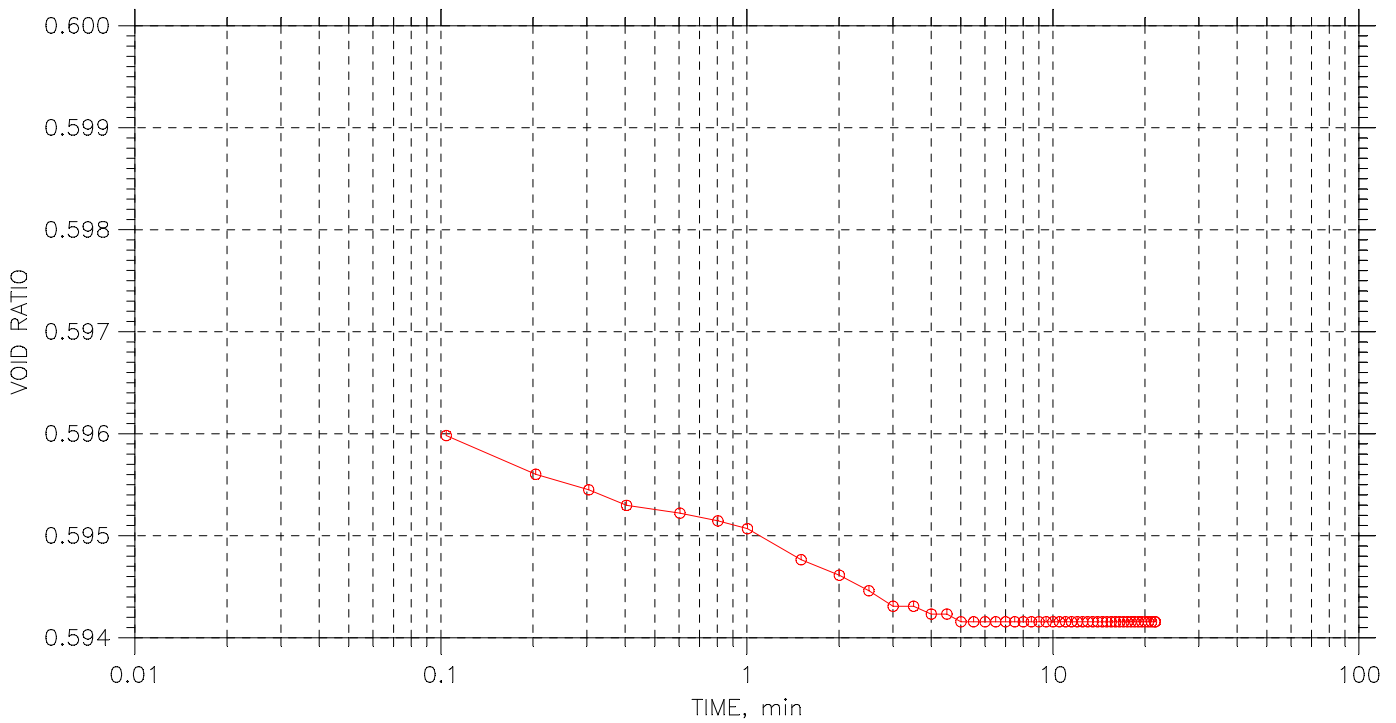
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 15

Stress: 1. tsf



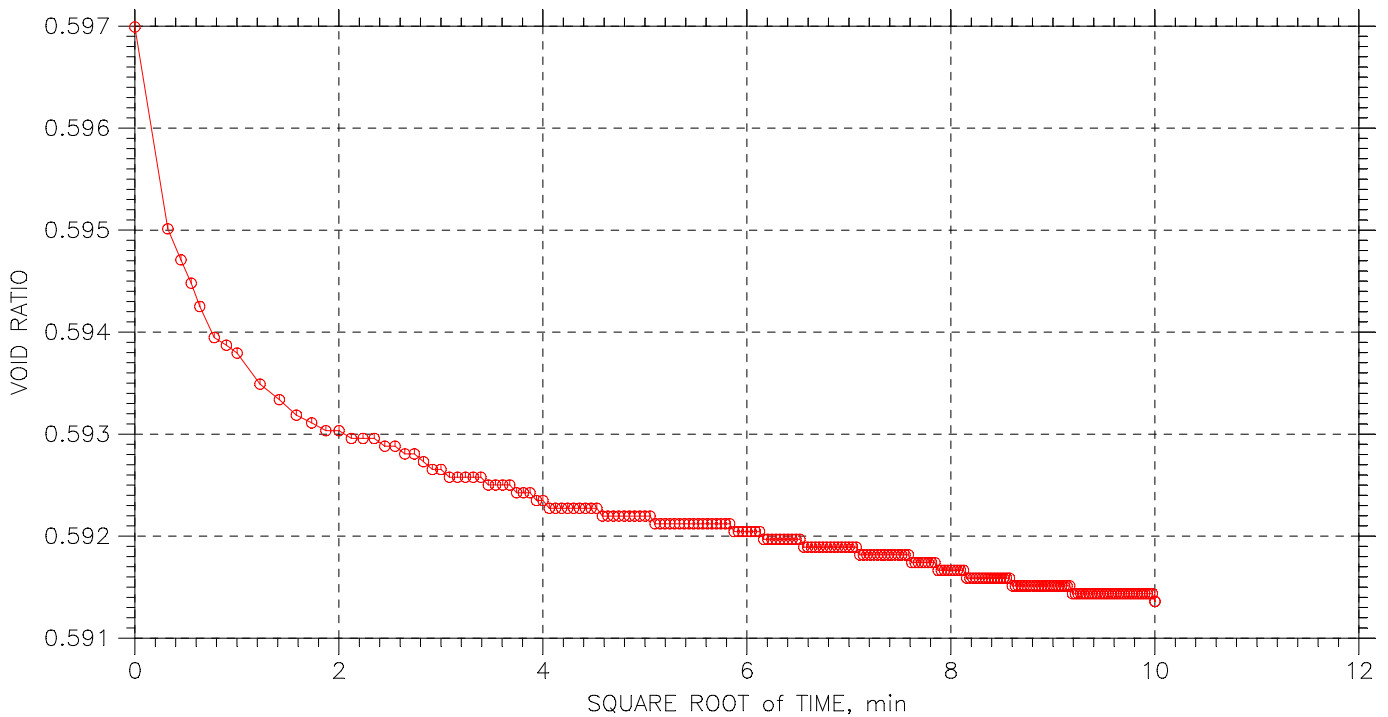
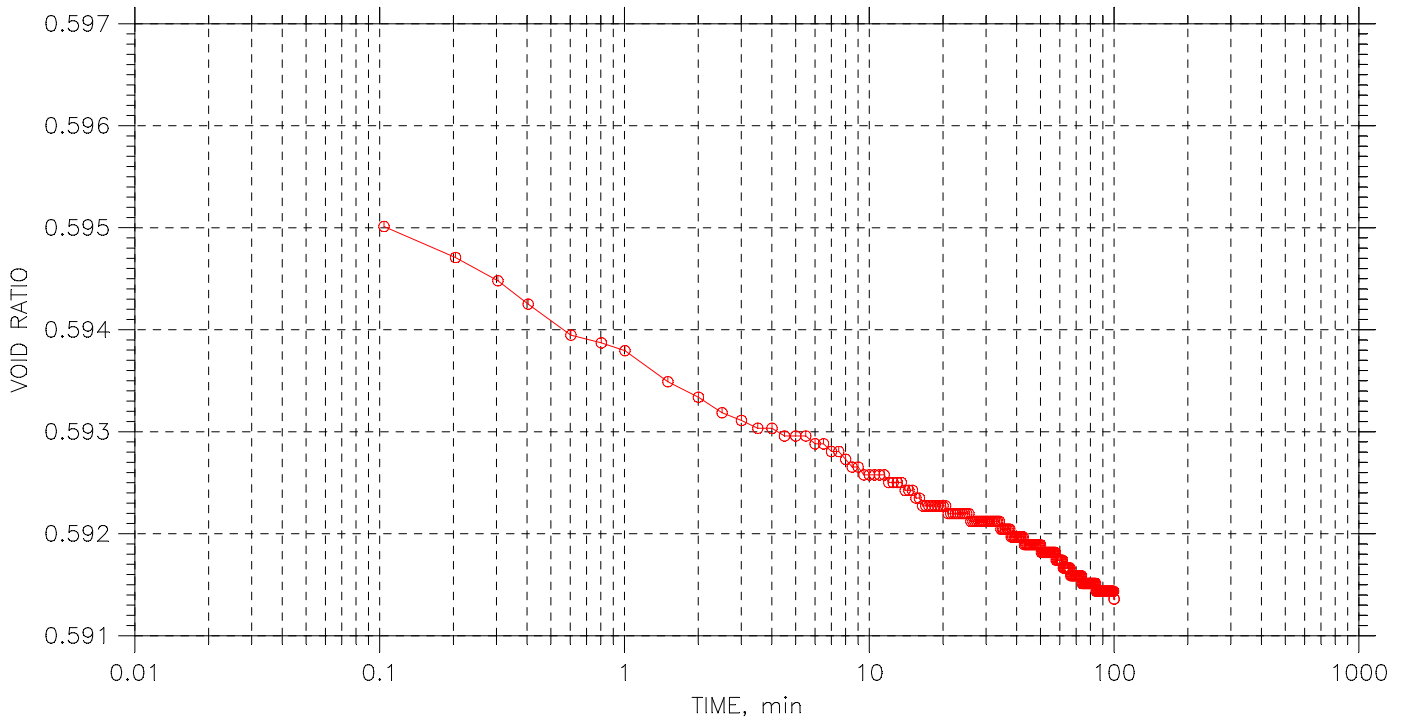
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 15

Stress: 2. tsf



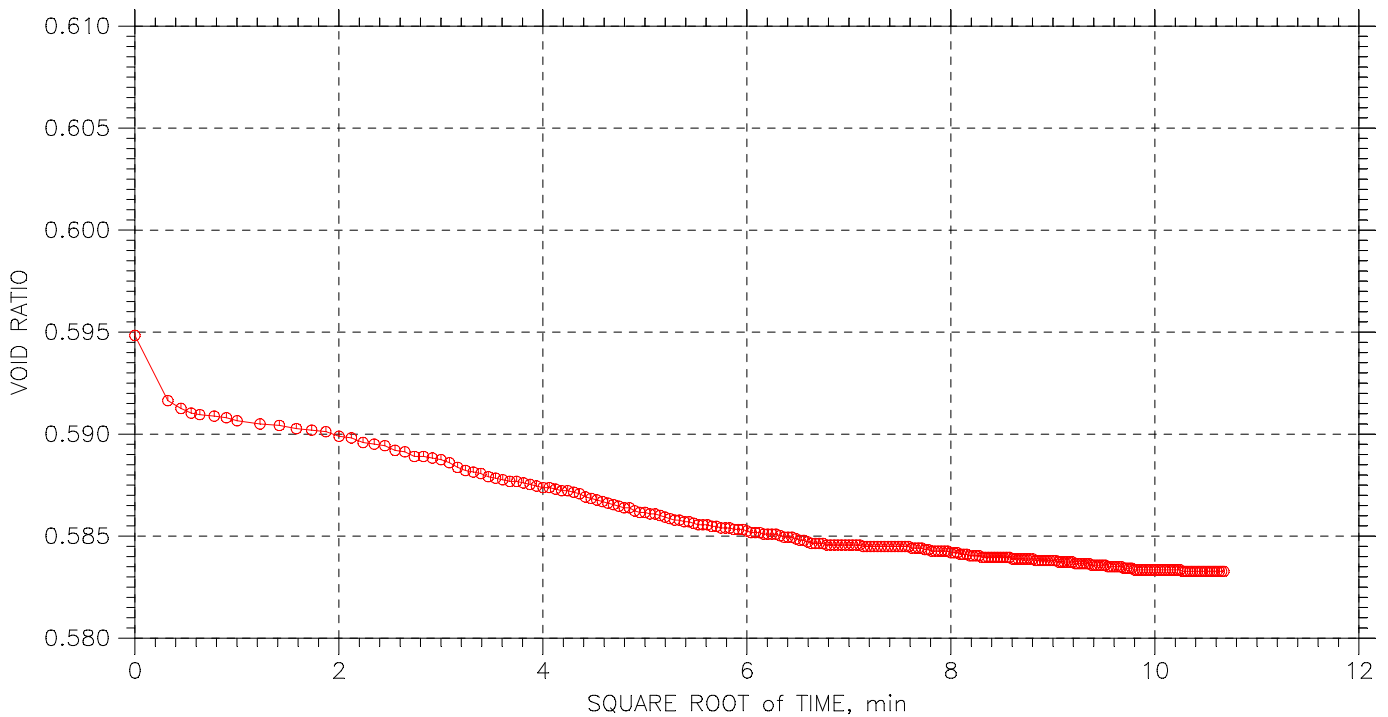
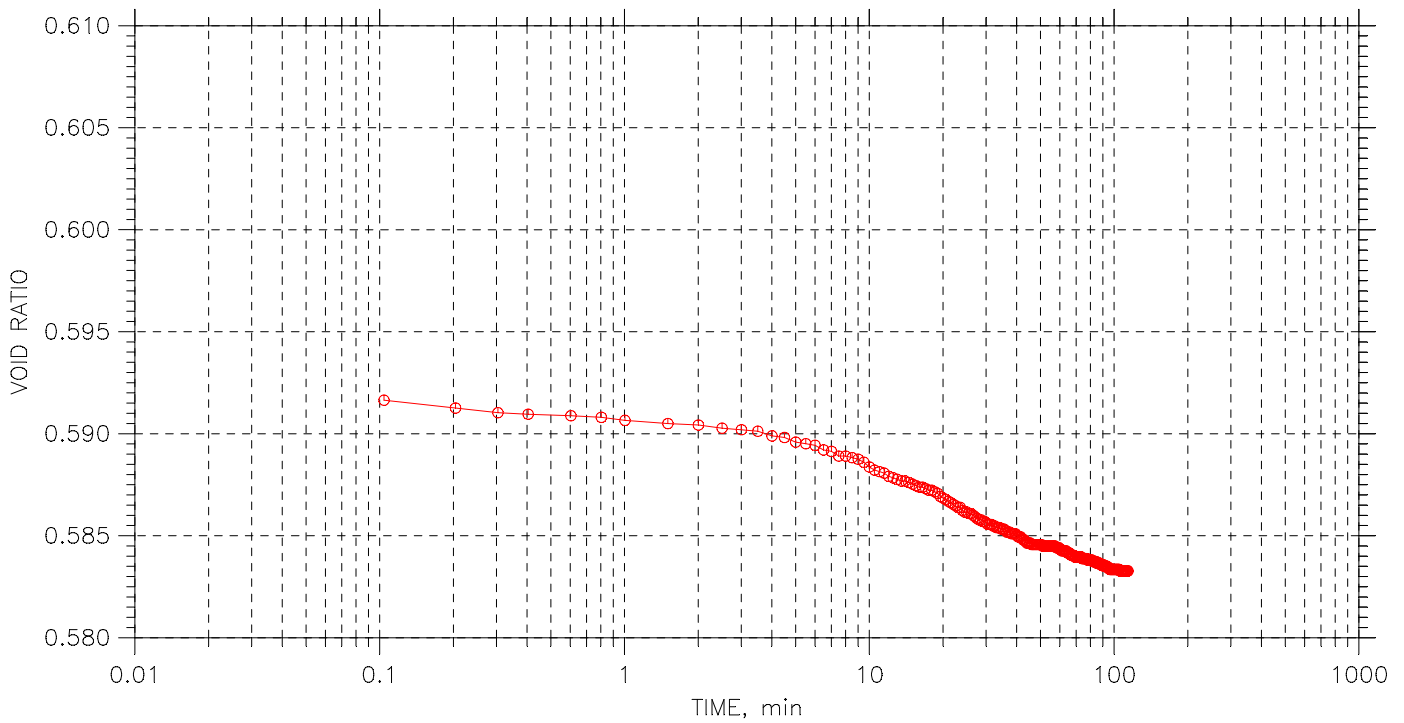
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 15

Stress: 4. tsf



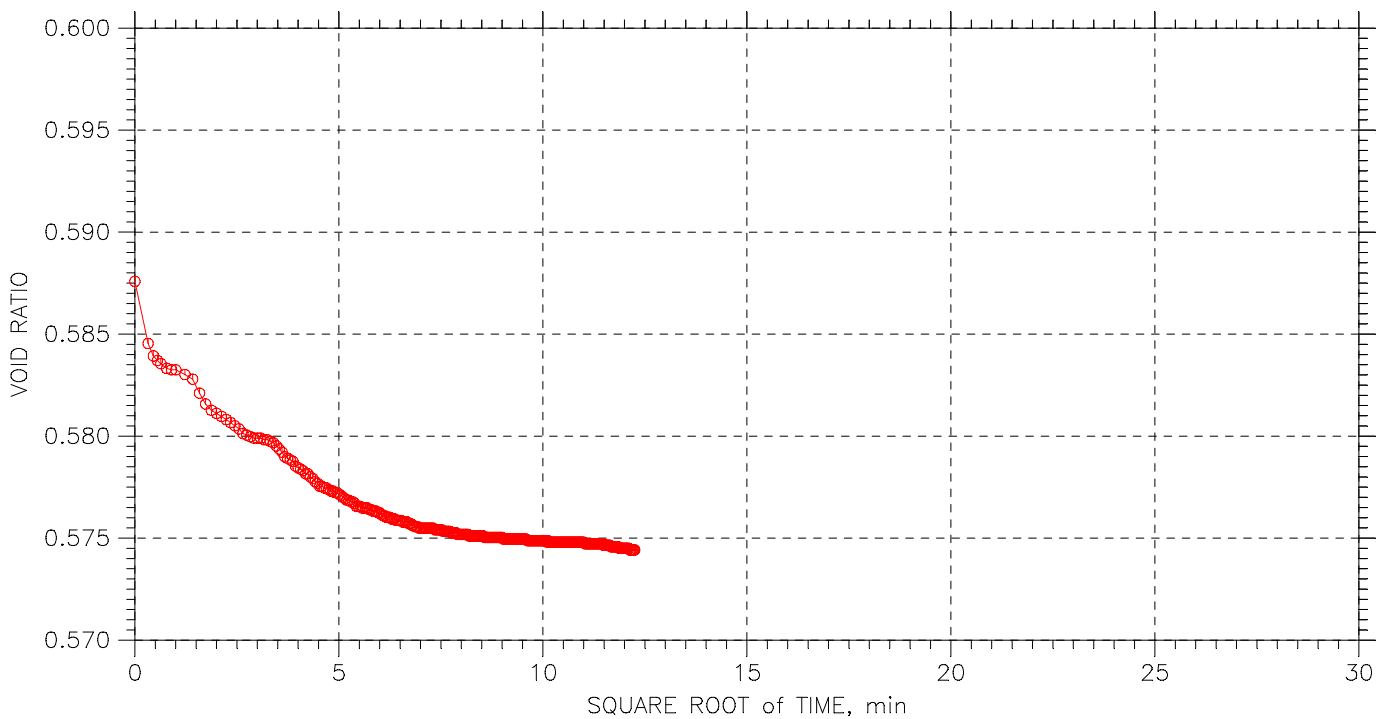
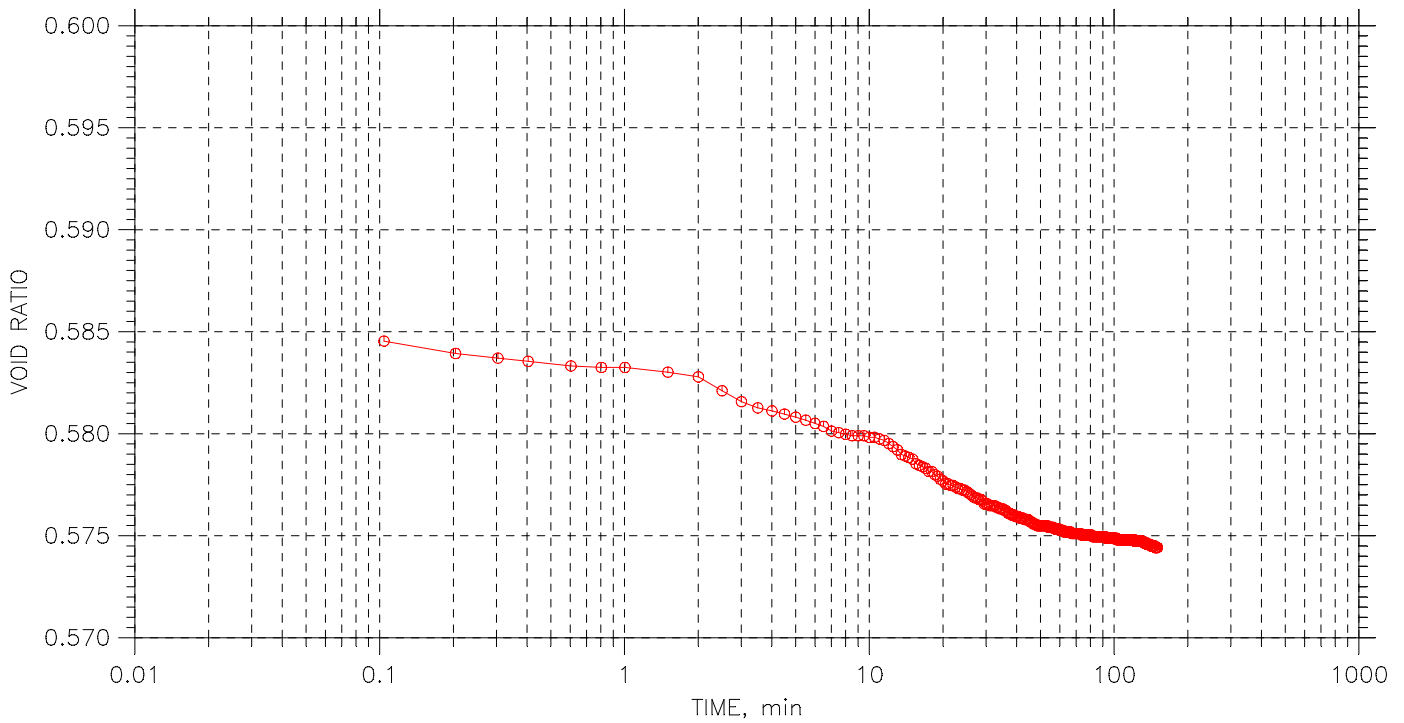
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 15

Stress: 8. tsf



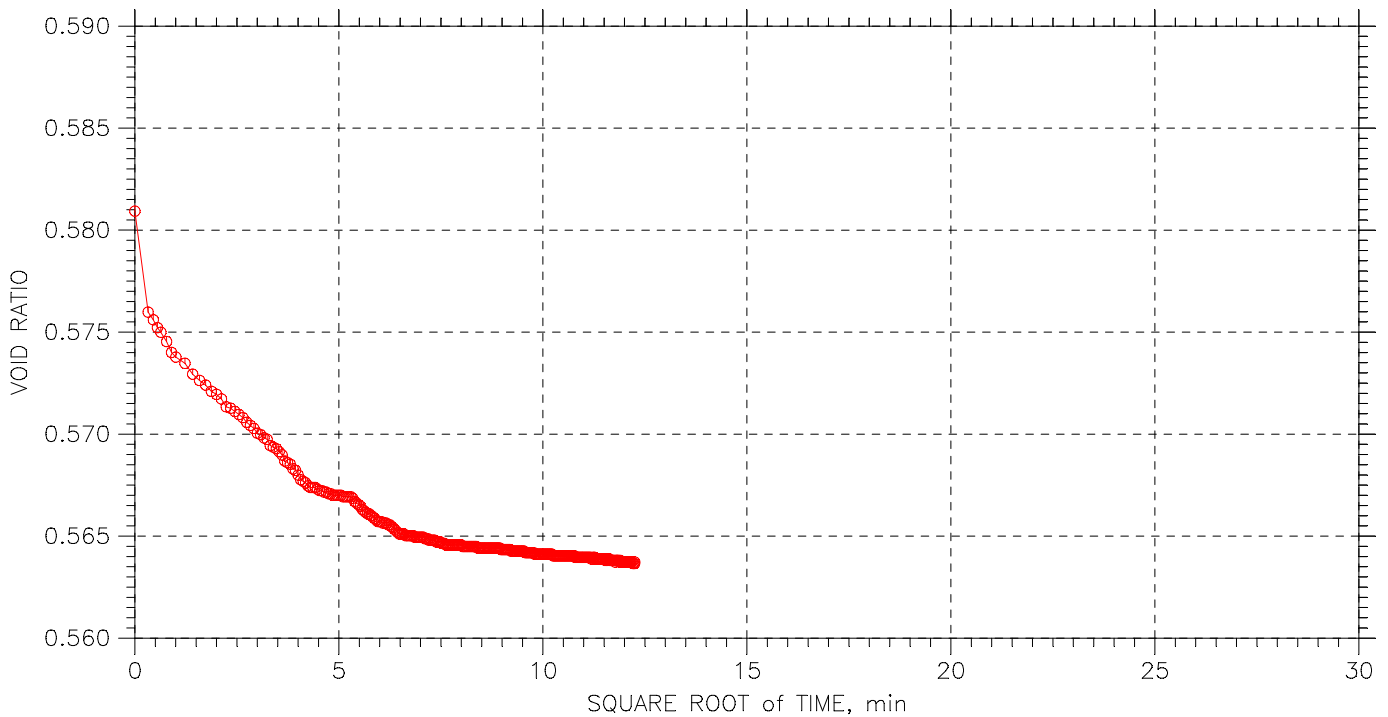
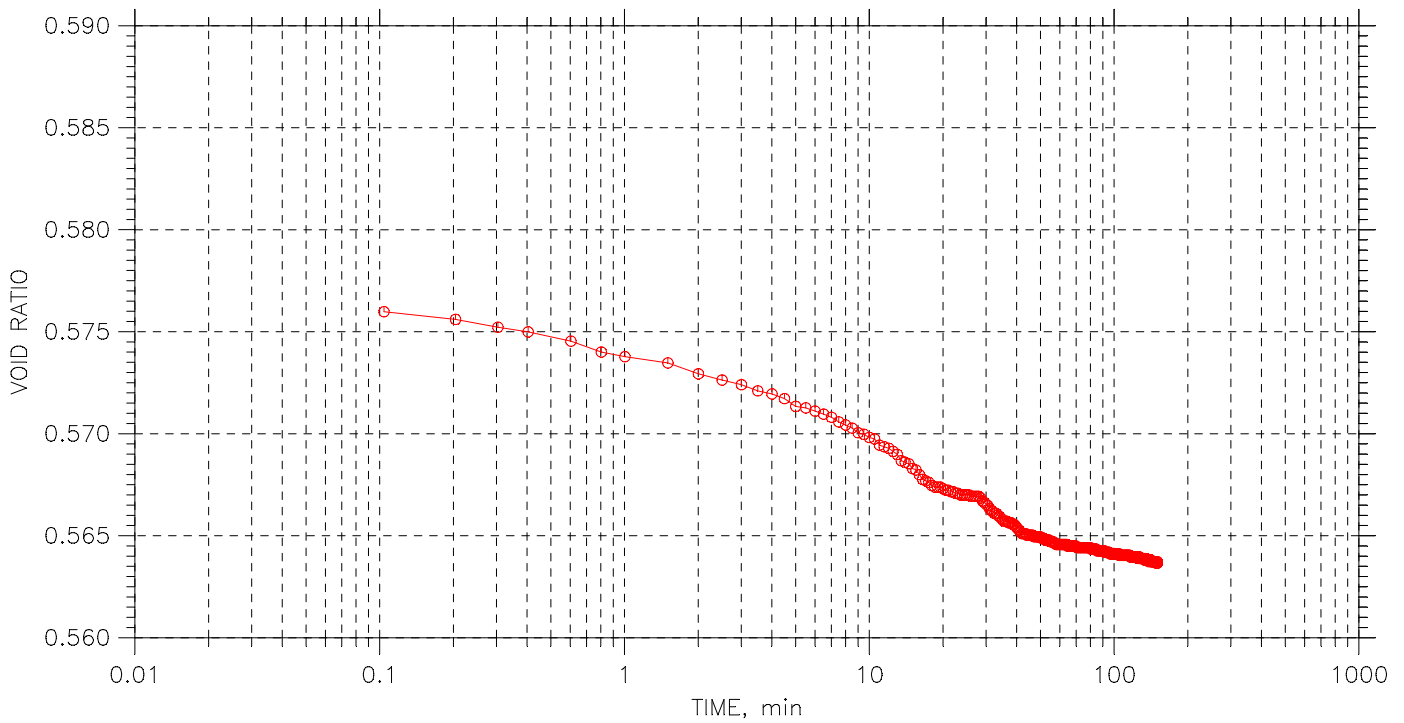
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 15

Stress: 16. tsf



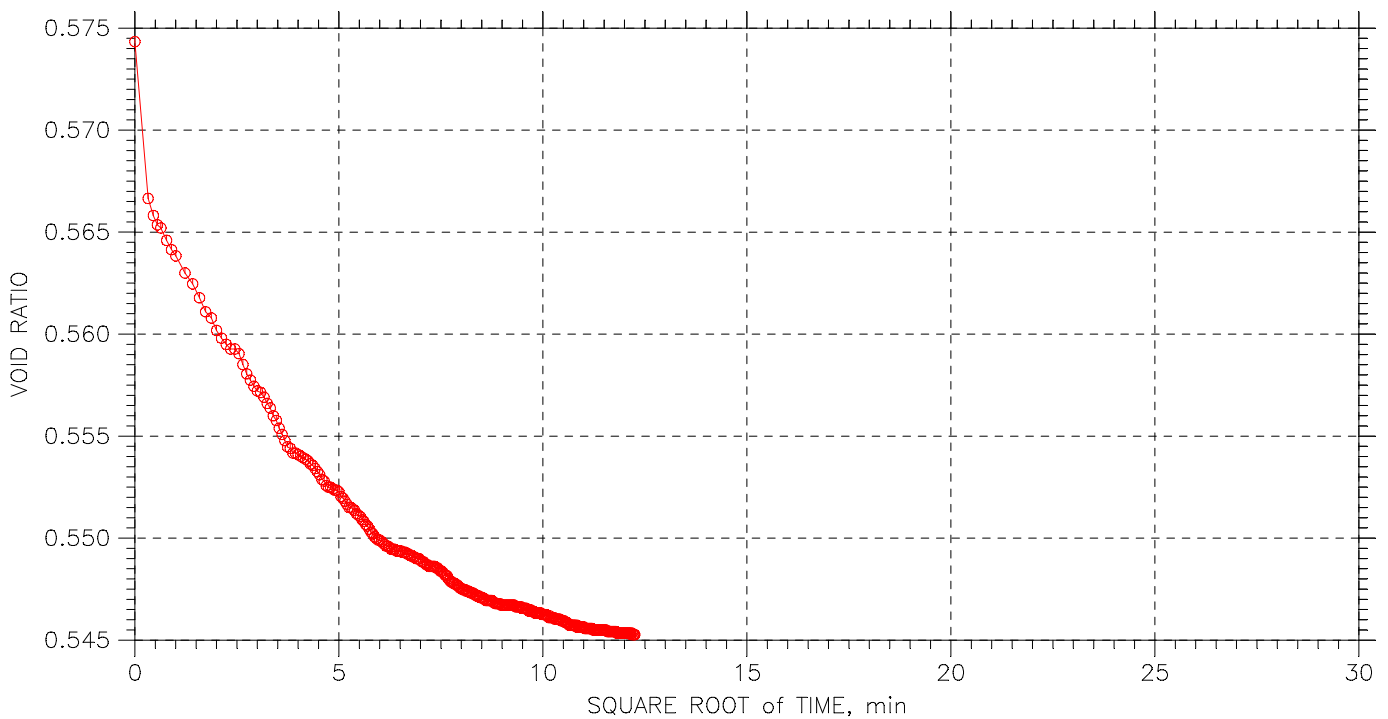
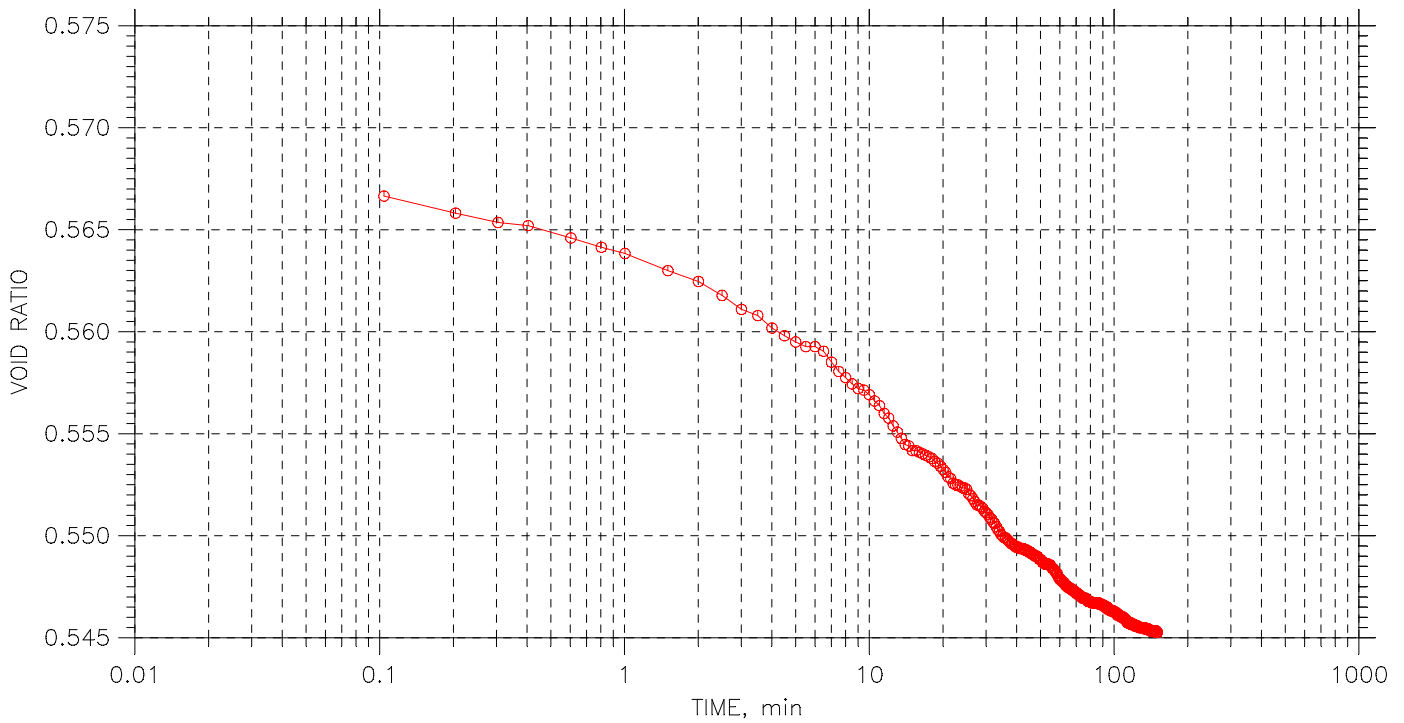
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 15

Stress: 32. tsf



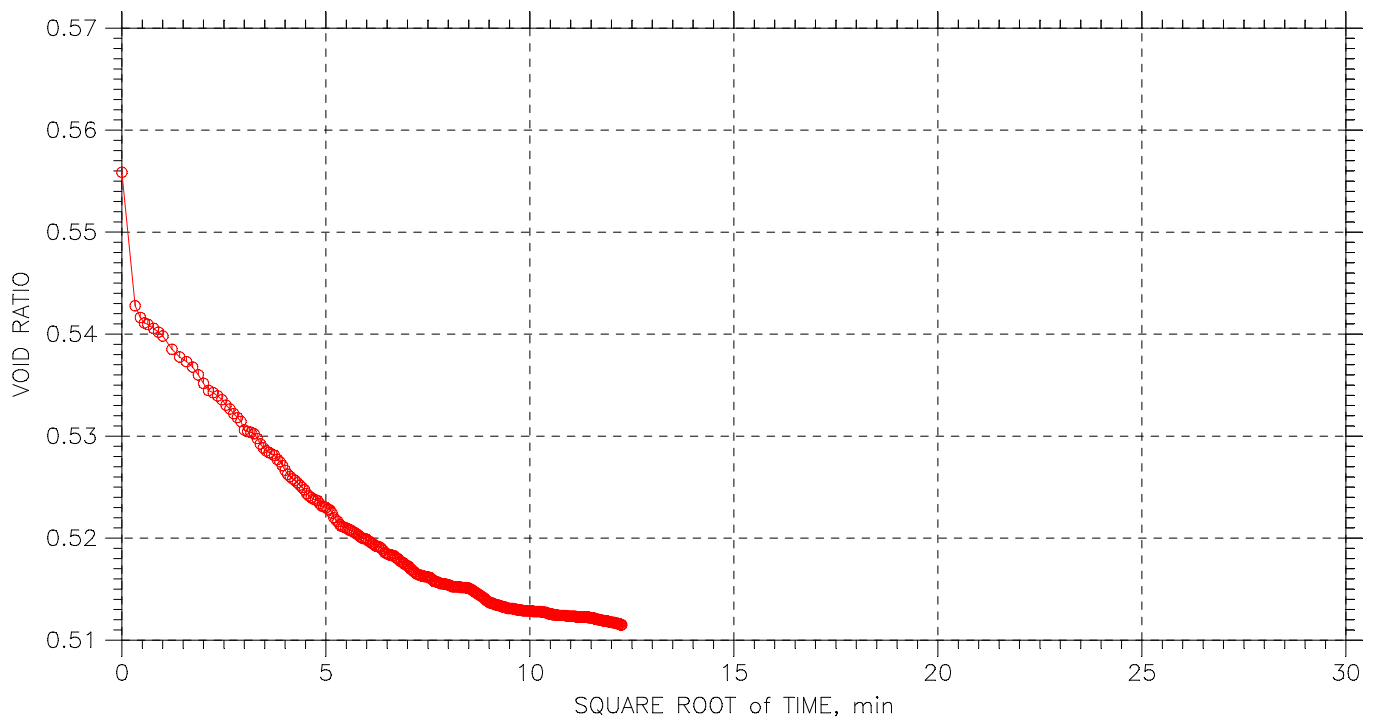
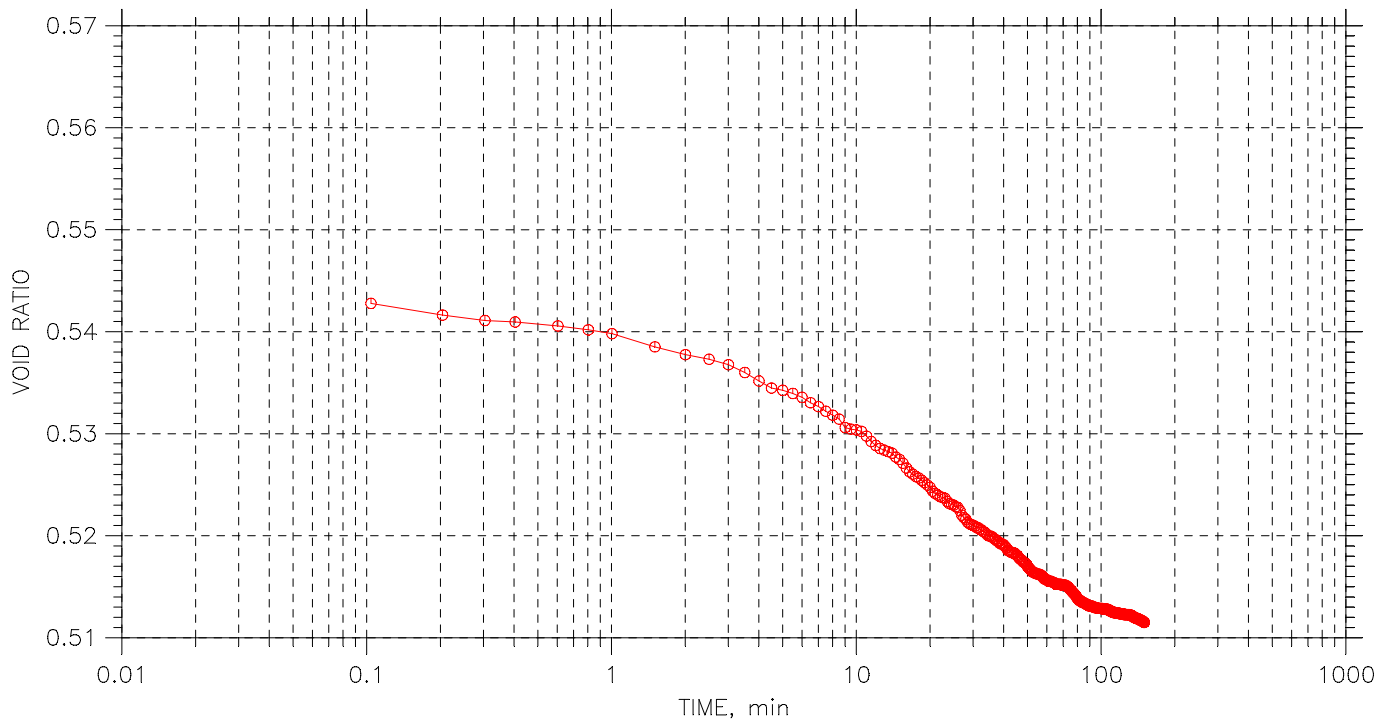
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 15

Stress: 64. tsf



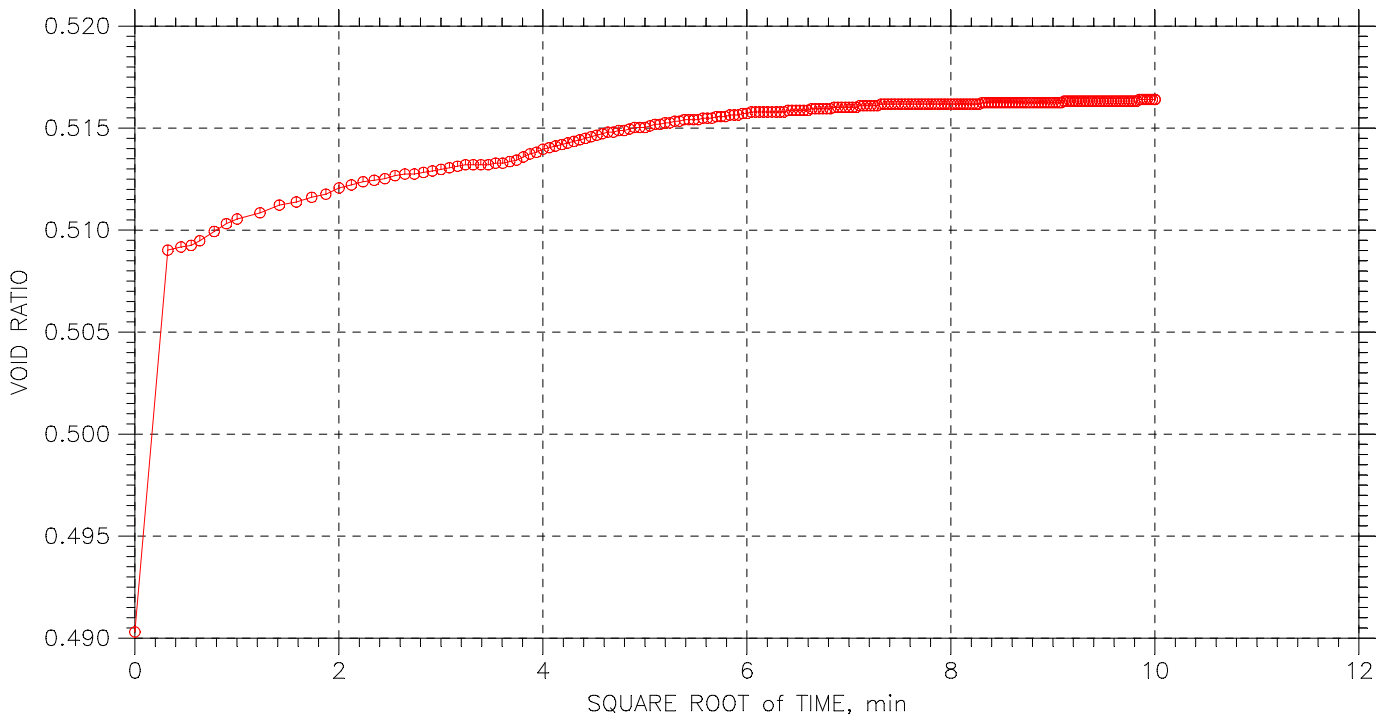
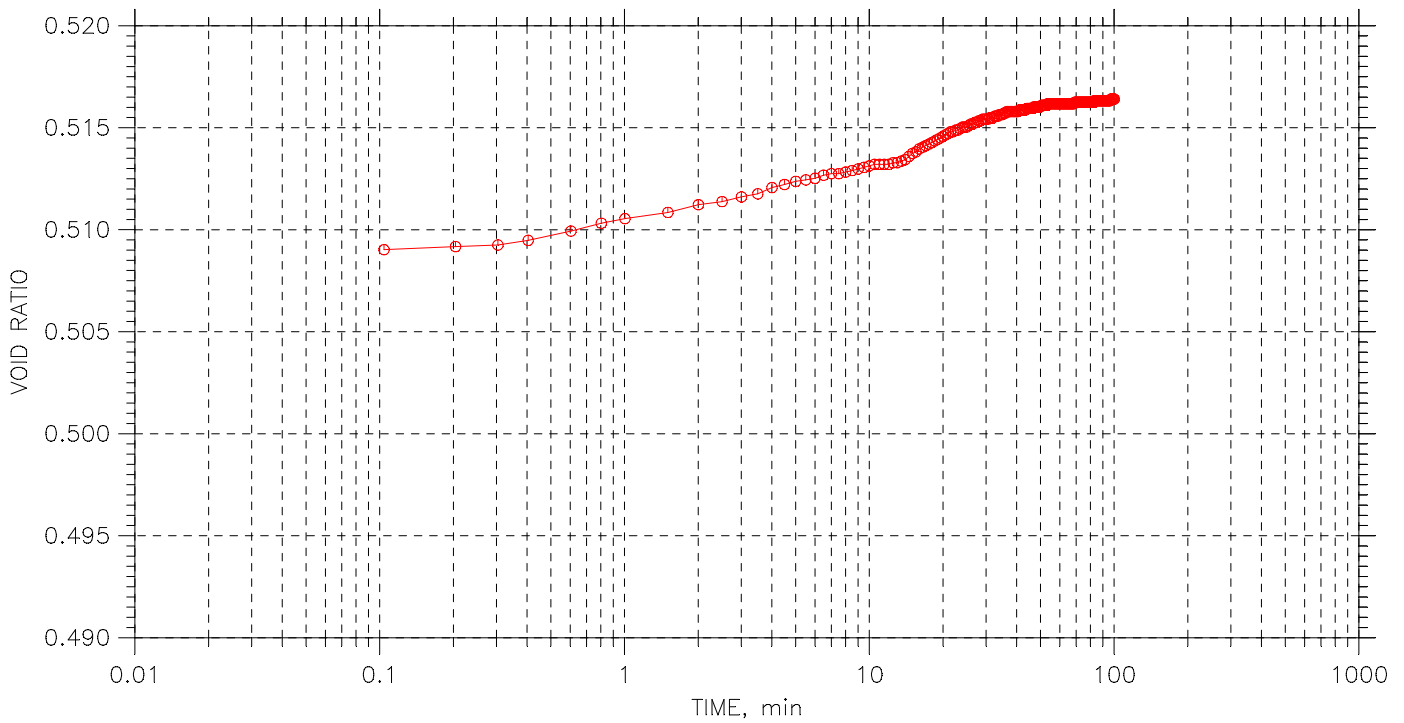
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 15

Stress: 16. tsf



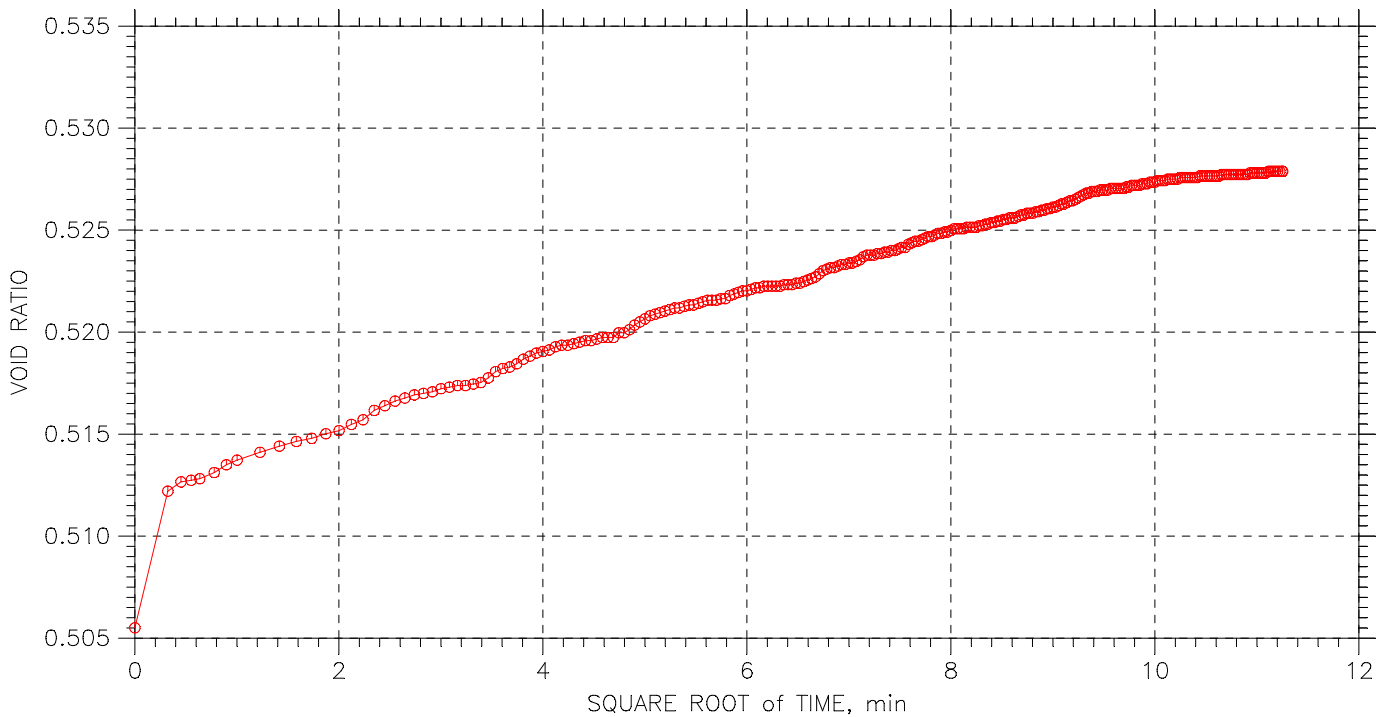
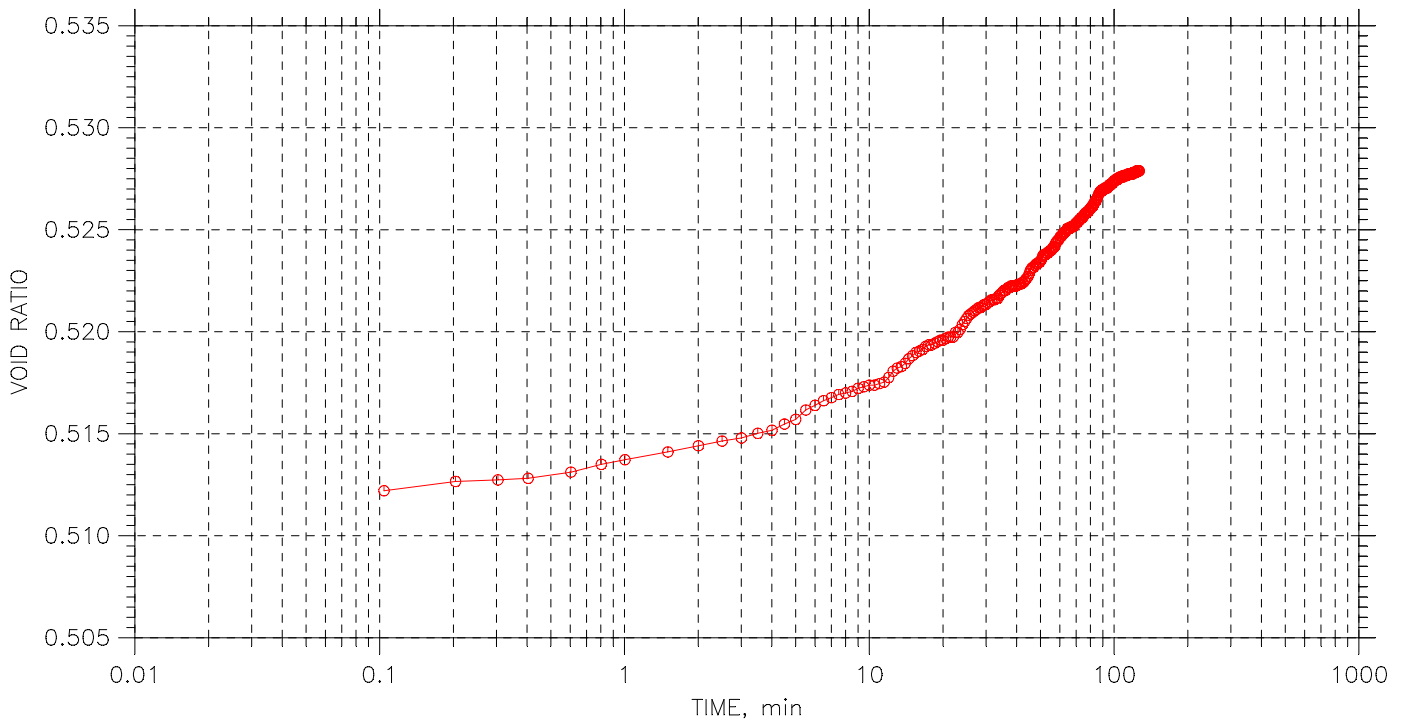
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 15

Stress: 4. tsf



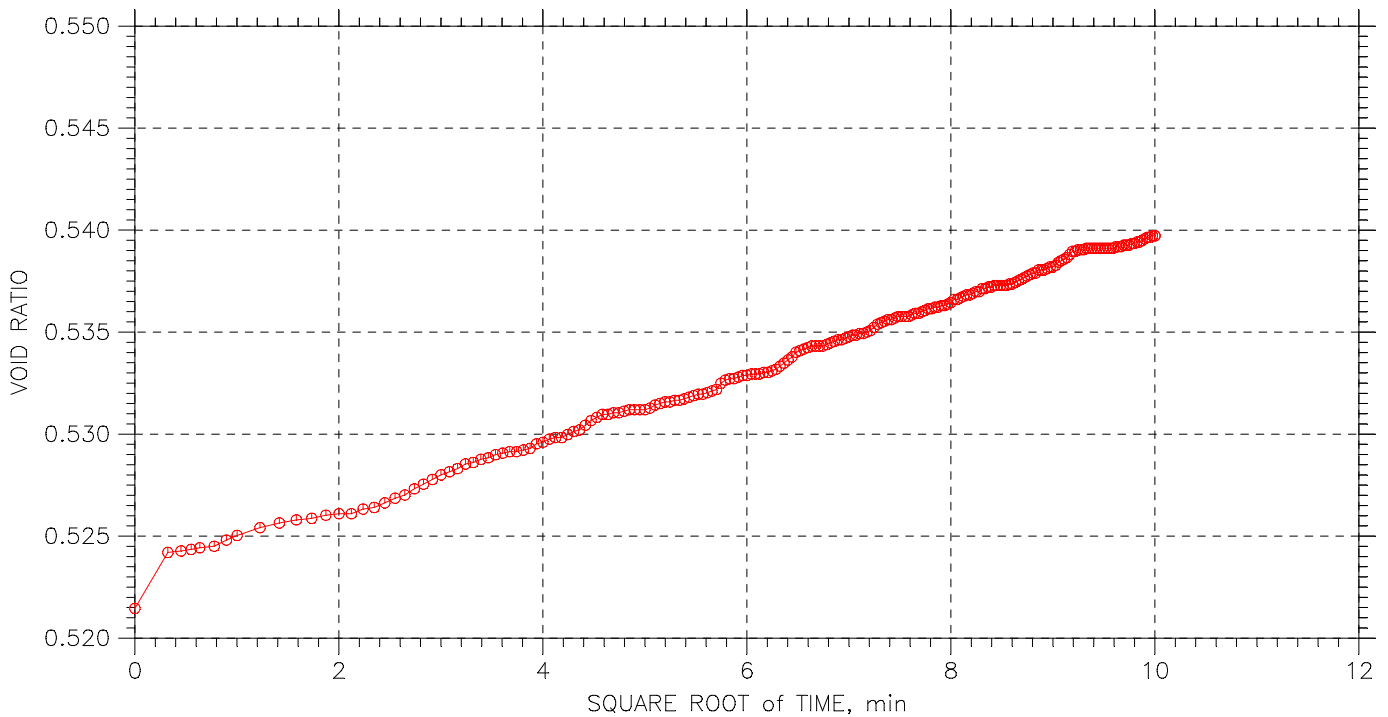
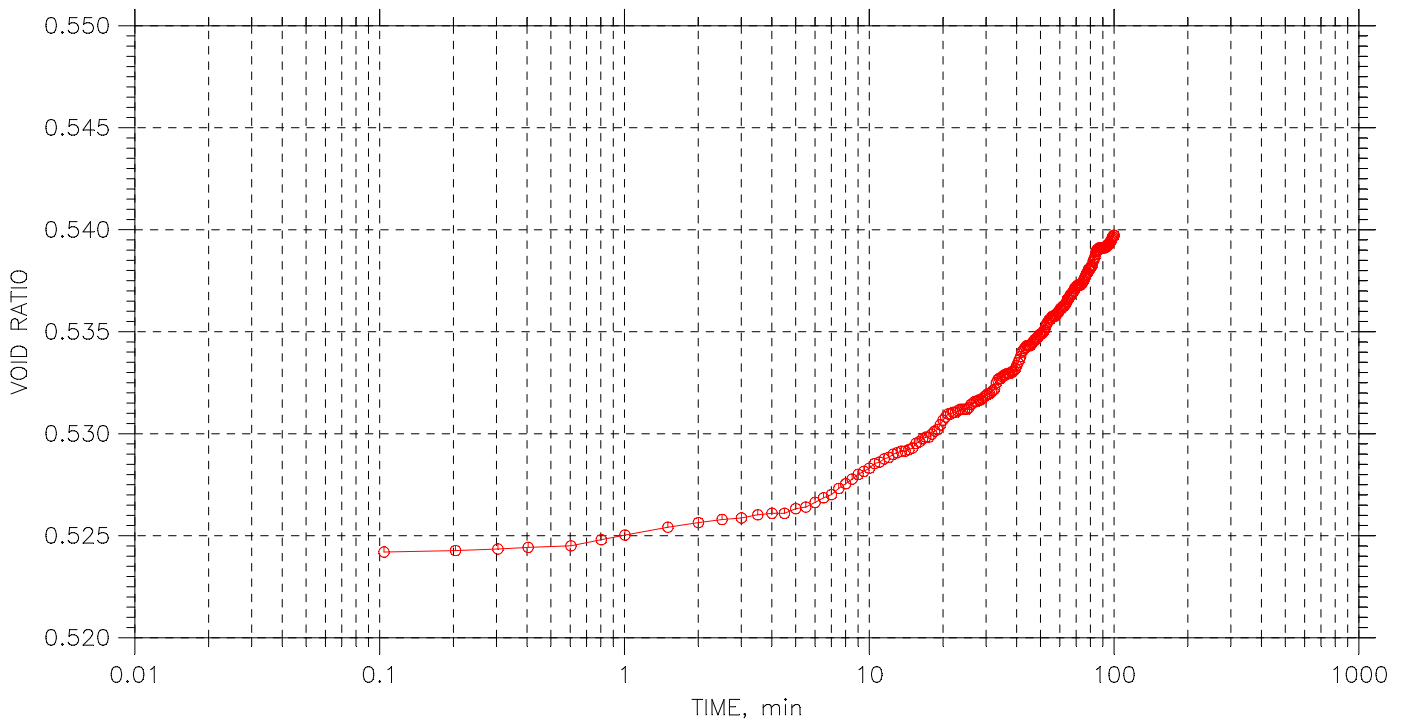
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 14 of 15

Stress: 1. tsf



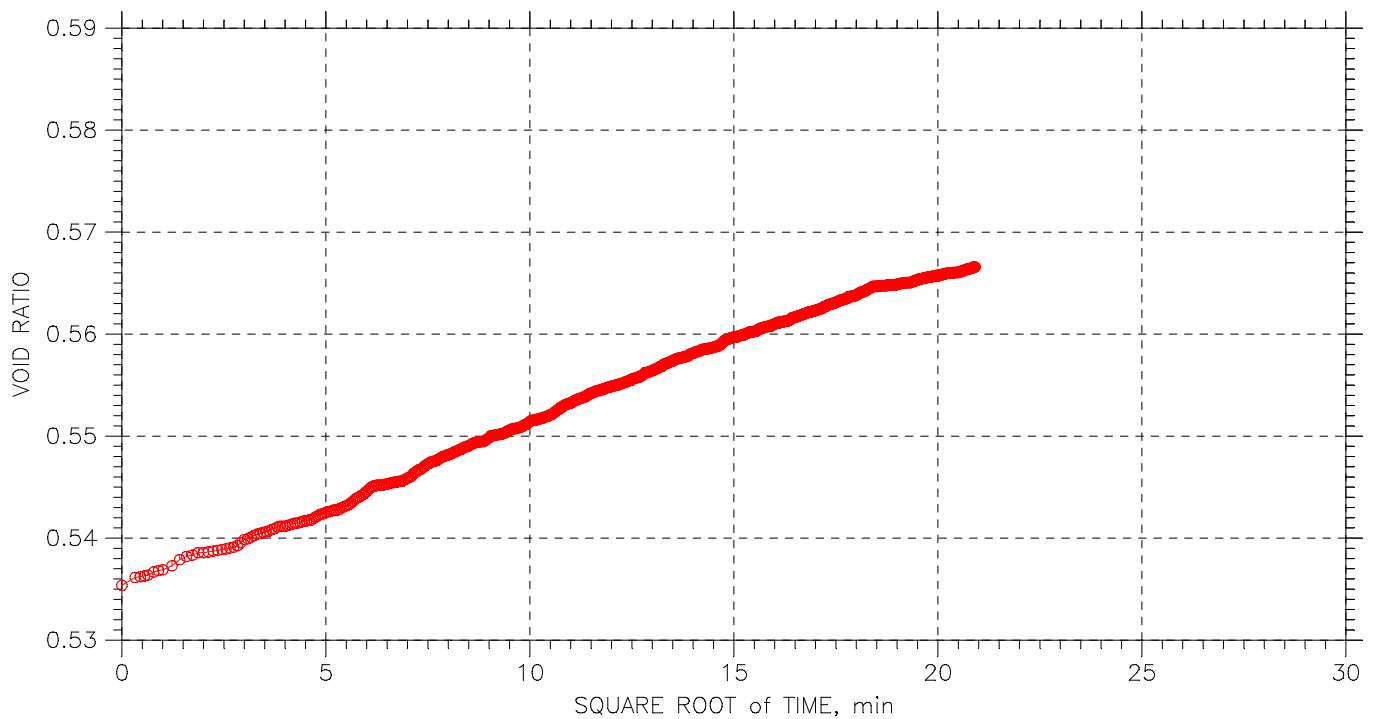
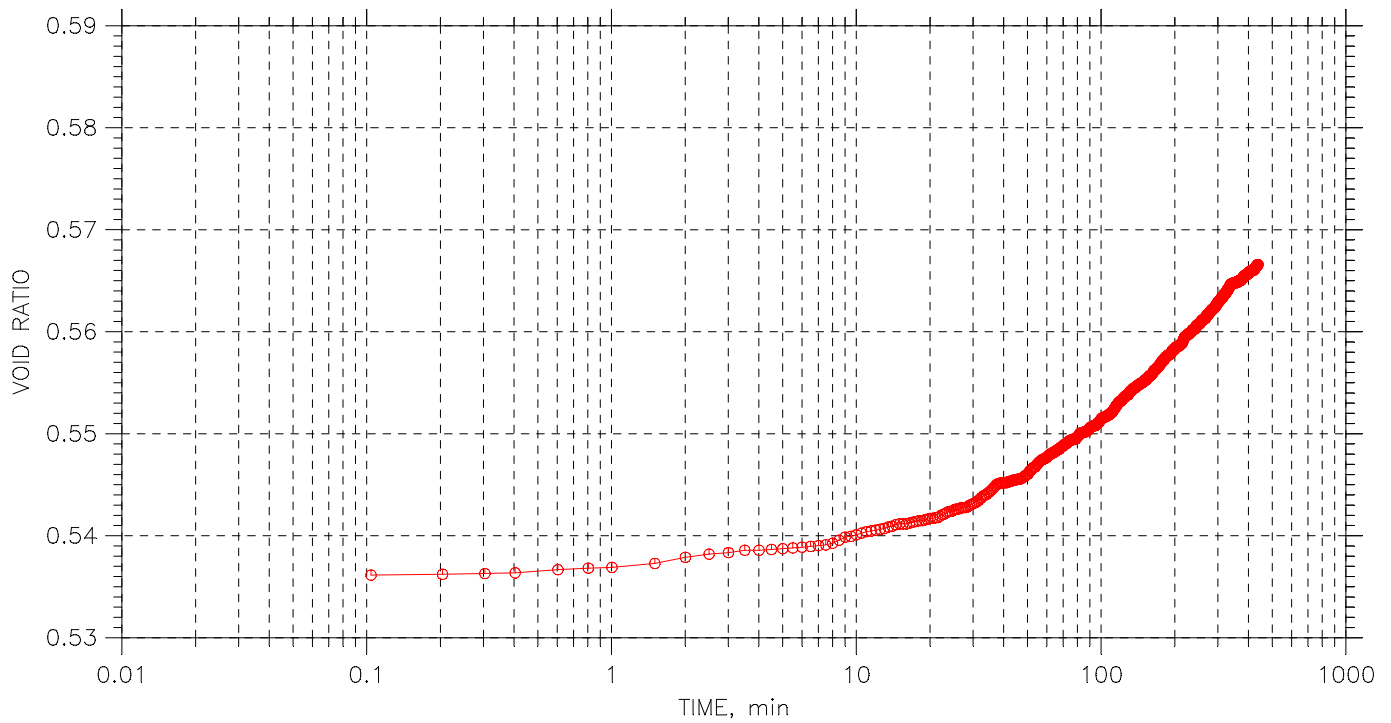
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		

CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 15 of 15

Stress: 0.25 tsf



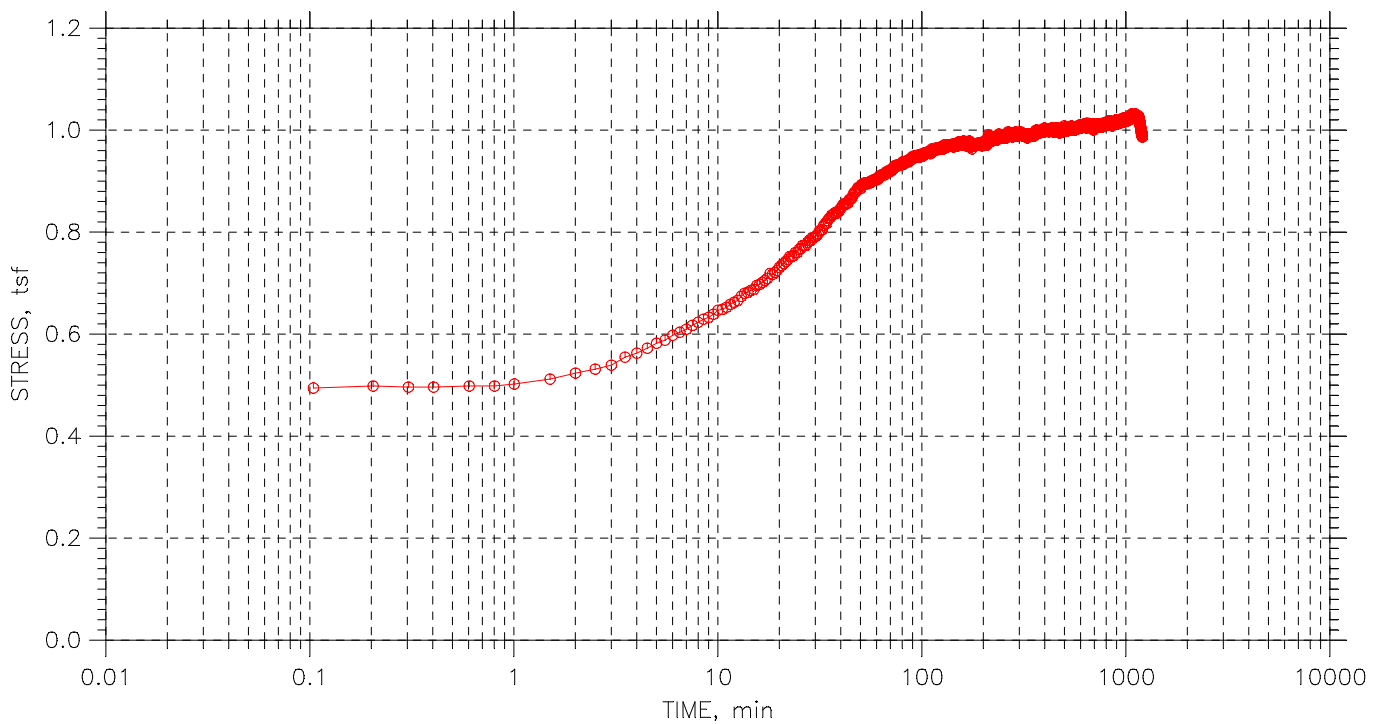
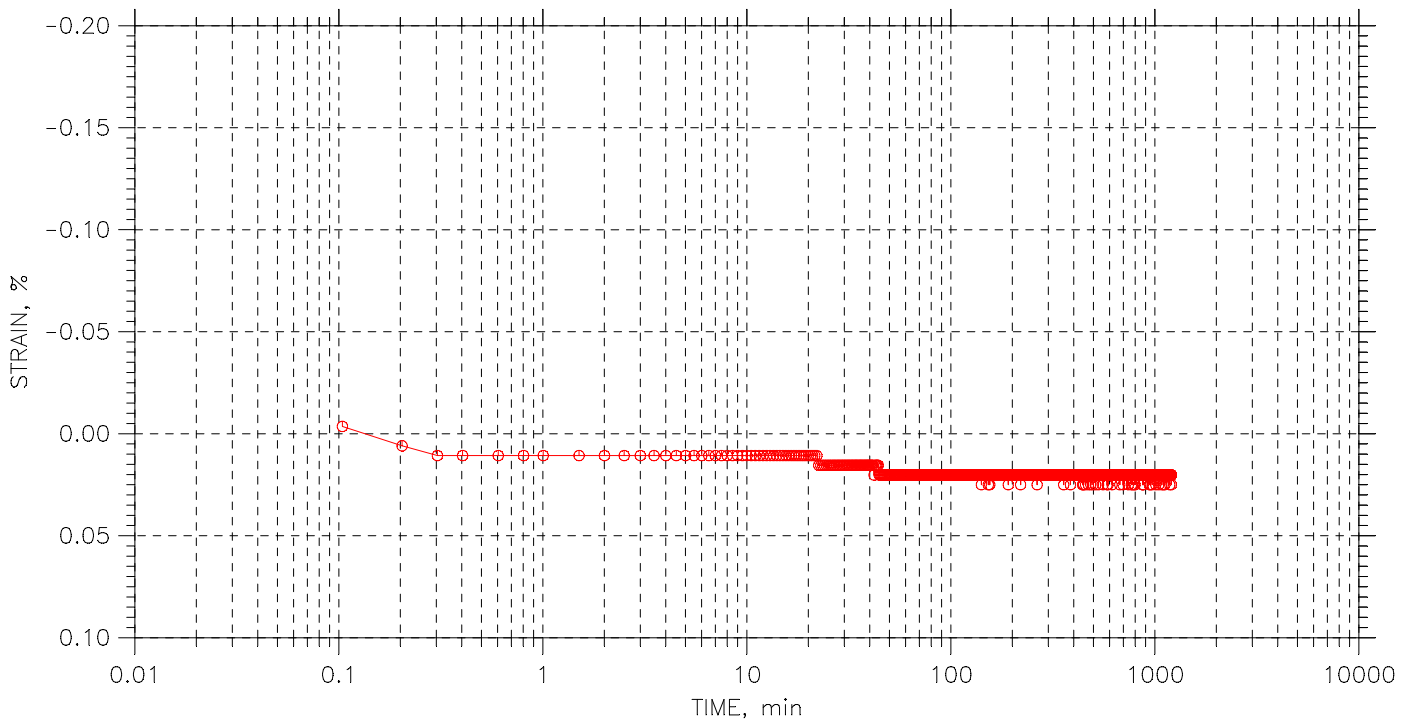
	Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-2	Test Date: 9/13/07	Depth: 37.5ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: Moist, Stiff, Dark Gray CLAY. (CL)		
	Remarks: ASTM D2435. Pitcher Sample RD-3A, P-2 @35.0'-37.0'		


CONSOLIDATION TEST DATA

TIME CURVES

Constant Volume Step: 1 of 1

Stress: 0.5 tsf

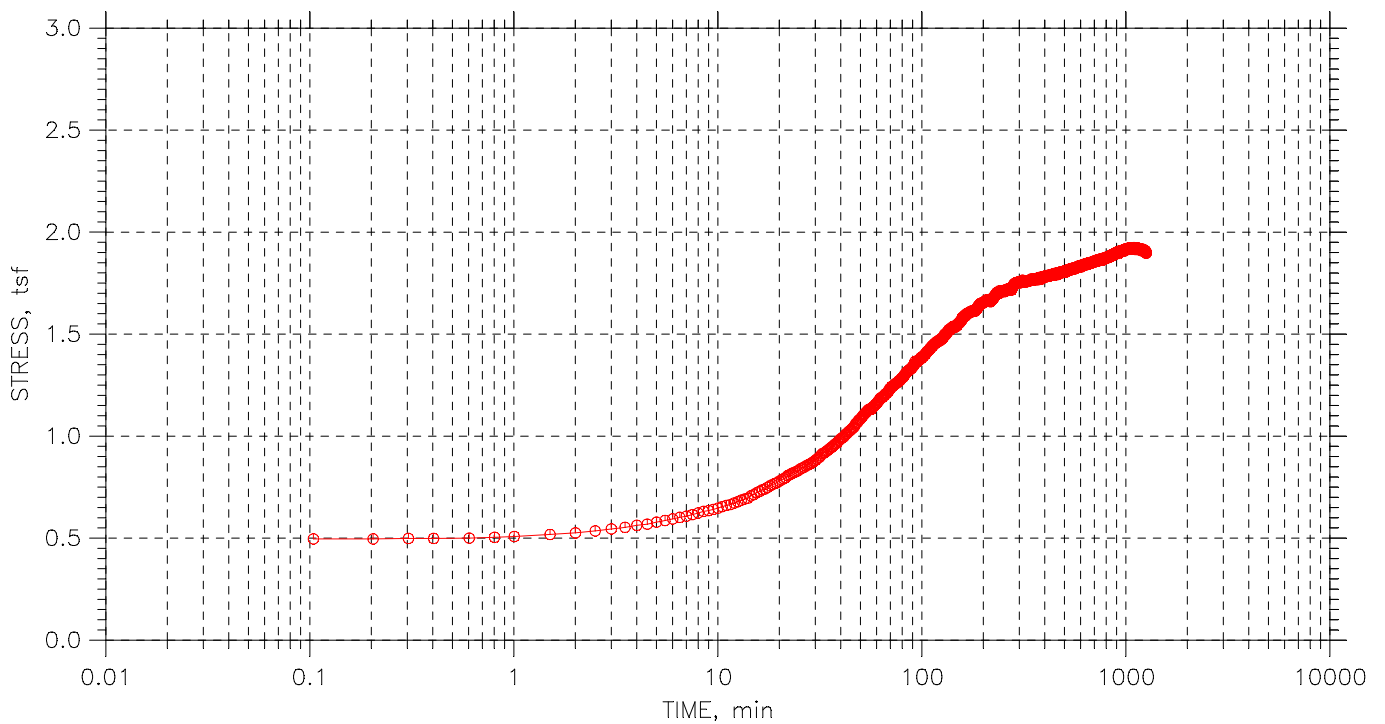
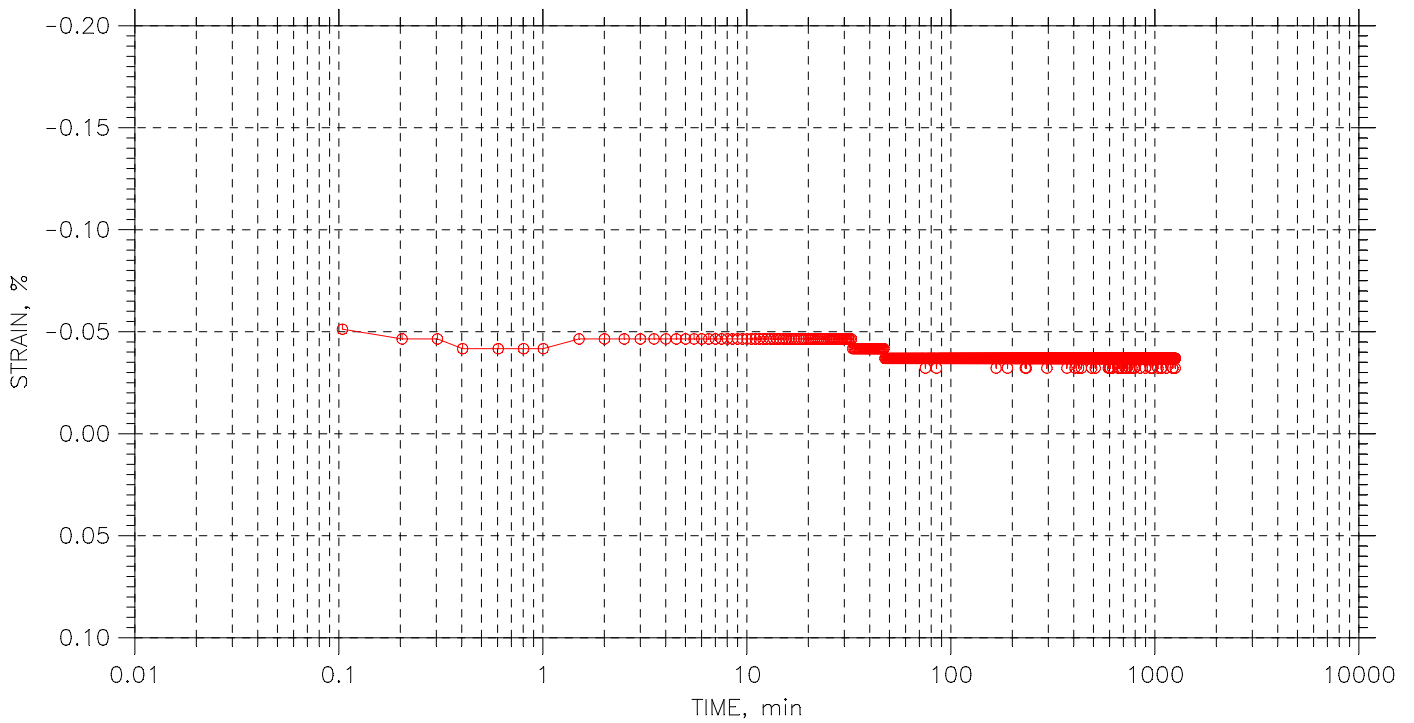


	Project: Purple Line	Location:	Project No.: 14961-0
	Boring No.: RD-3A	Tested By: sam	Checked By: bert
	Sample No.: P-4	Test Date: 9/15/07	Depth: 54.75ft
	Test No.: No. 1	Sample Type: Pitcher	Elevation:
	Description: VISUAL: Moist, Medium Soft, Dark Gray CLAY with Silt Lenses and trace rock fragments. (CL)		
	Remarks: ASTM D4546. Pitcher Sample RD-3A, P-4 @ 52'-55'		



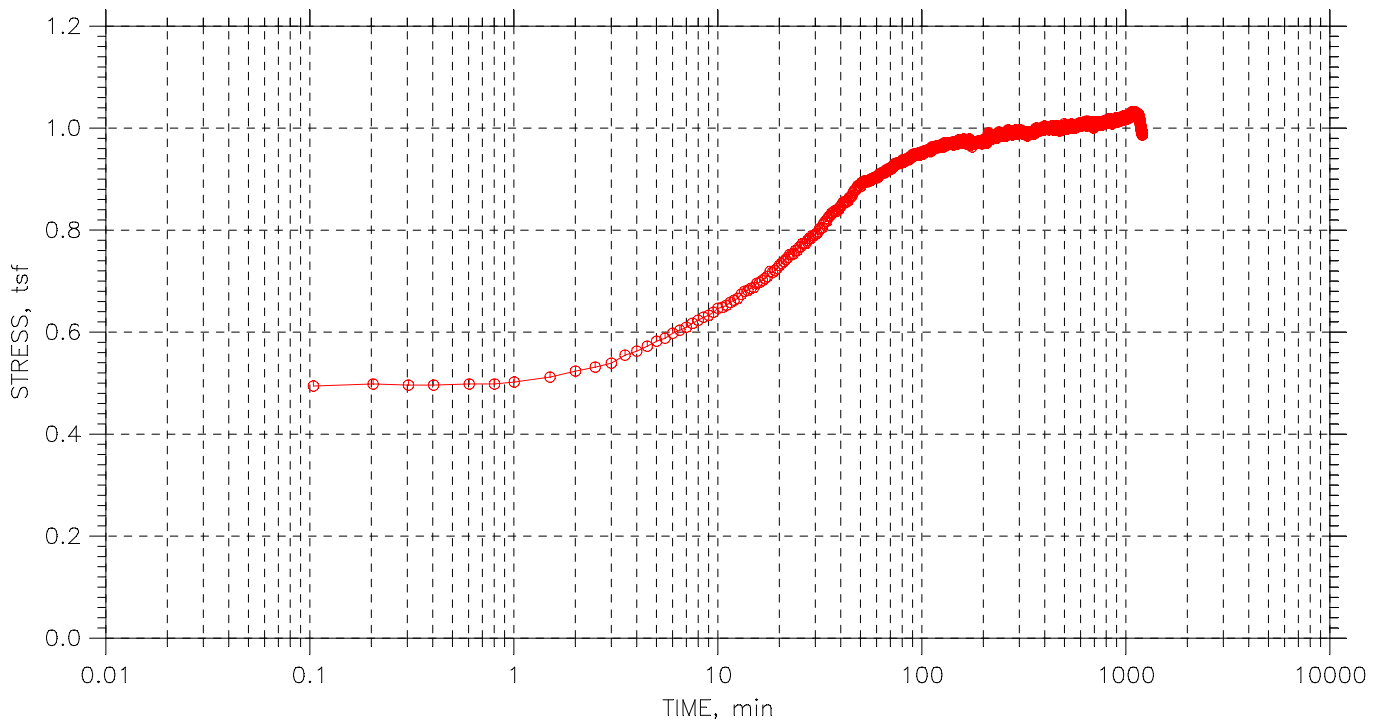
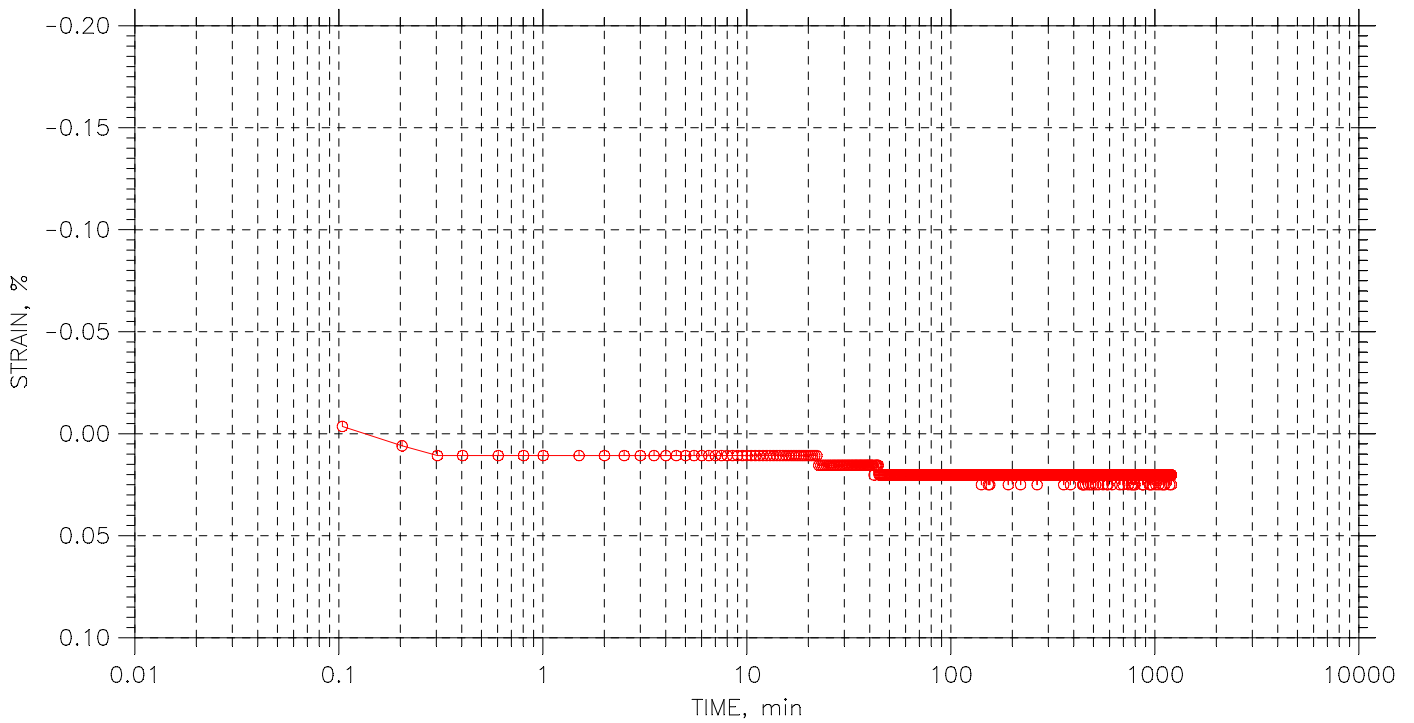
ONE-DIMENSIONAL SWELL TEST RESULTS

Constant Volume Step: 1 of 1
Stress: 0.5 tsf



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
Boring No.: RD-2A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/15/07	Depth: 34.75ft
Test No.: No. 1	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Mottled Red, Brown and Gray CLAY. (CH)		
Remarks: ASTM D4546. Pitcher Sample RD-2A, P-1 @ 32'-35'		

Constant Volume Step: 1 of 1
Stress: 0.5 tsf

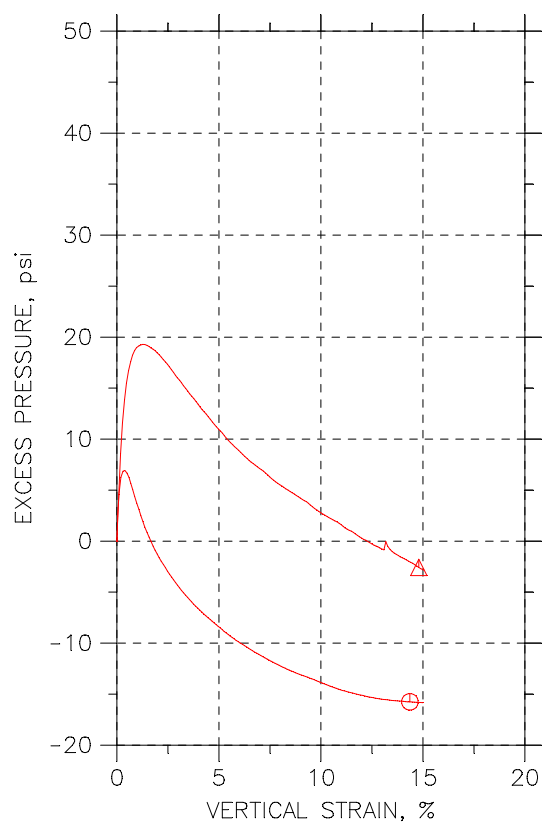
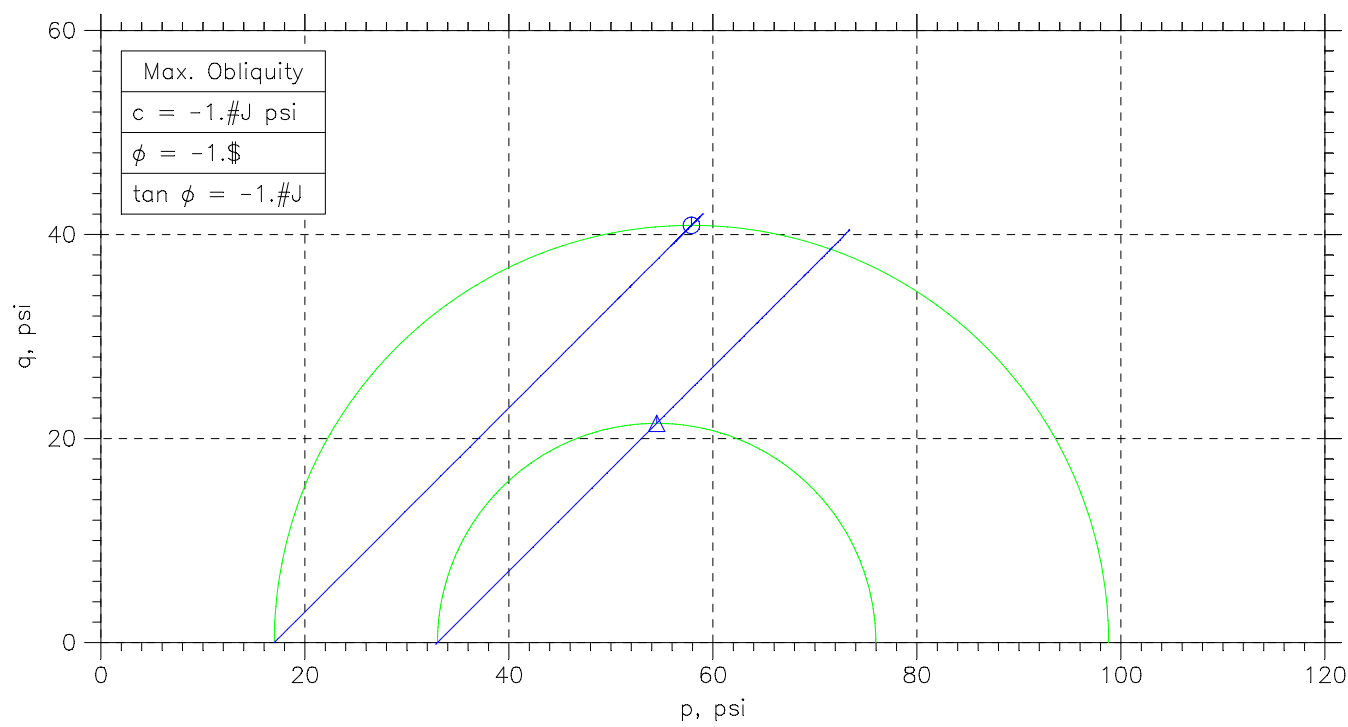


Project: Purple Line	Location: Riverdale, MD	Project No.: 14961-0
Boring No.: RD-3A	Tested By: sam	Checked By: bert
Sample No.: P-4	Test Date: 9/15/07	Depth: 54.75ft
Test No.: No. 1	Sample Type: Pitcher	Elevation:
Description: Moist, Medium Soft, Dark Gray CLAY with Silt Lenses and trace rock fragments. (CL)		
Remarks: ASTM D4546. Pitcher Sample RD-3A, P-4 @ 52'-55'		



ISOTROPICALLY CONSOLIDATED UNDRAINED TRIAXIAL TEST RESULTS

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



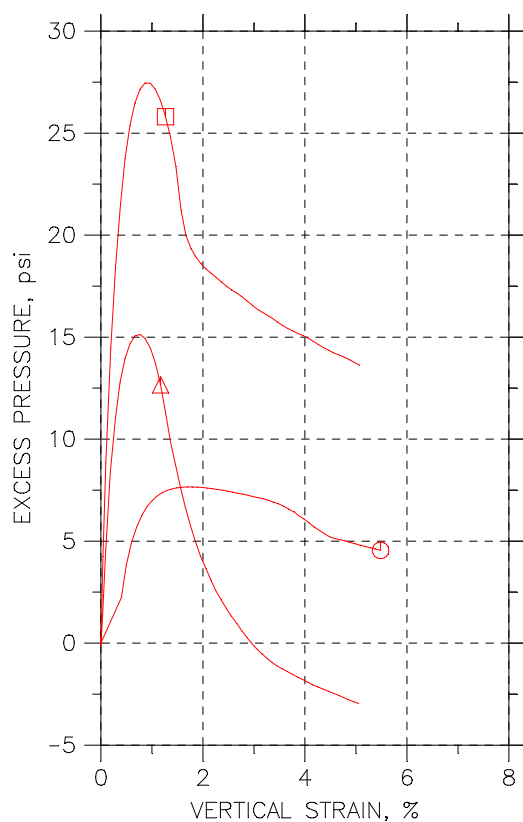
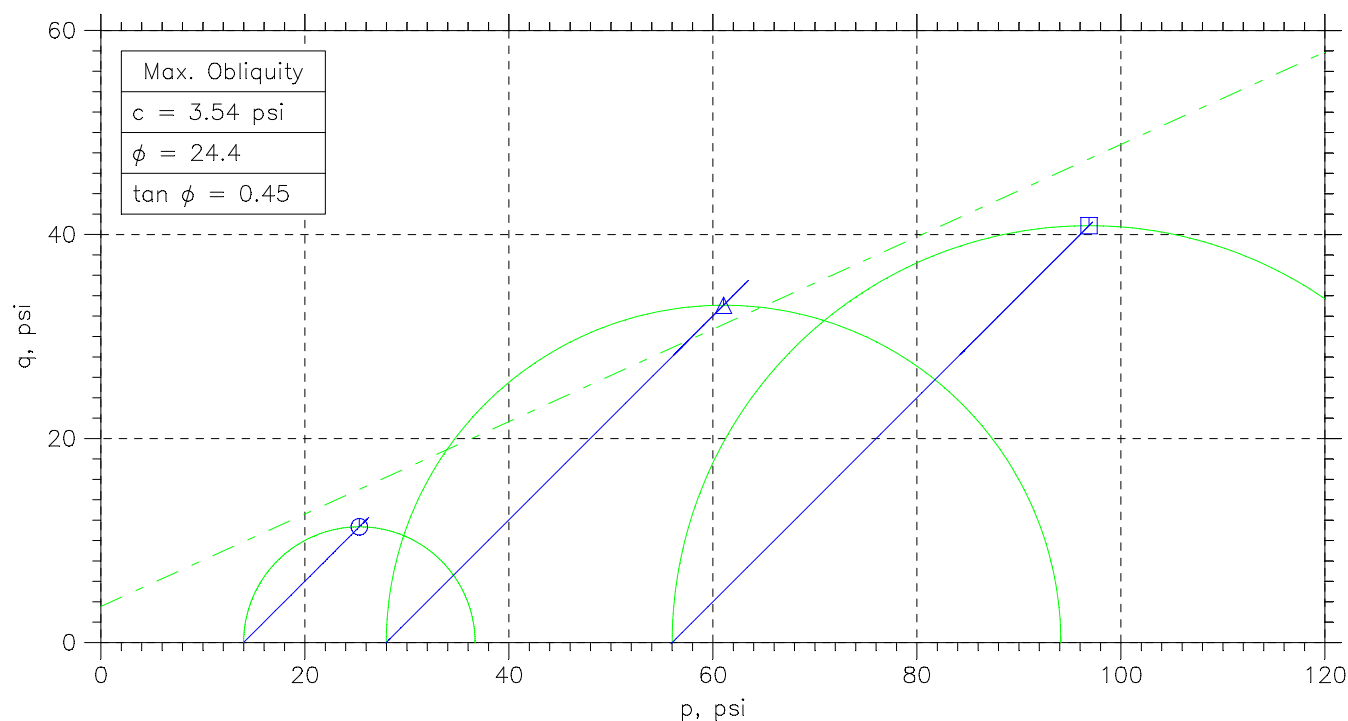
Symbol	⊙	△		
Sample No.	P-1	P-1		
Test No.	1	2		
Depth	23'-23.5'	23.5'-24'		
Initial	Diameter, in	2.01	2.01	
	Height, in	3.999	3.999	
	Water Content, %	15.6	16.4	
	Dry Density, pcf	117.2	119.9	
	Saturation, %	96.1	109.2	
Before Shear	Void Ratio	0.438	0.406	
	Water Content, %	15.3	18.5	
	Dry Density, pcf	119.2	112.5	
	Saturation*, %	100.0	100.0	
	Void Ratio	0.414	0.498	
	Back Press., psi	114.9	102.	
	Ver. Eff. Cons. Stress, psi	17.	32.97	
	Shear Strength, psi	42.01	40.46	
	Strain at Failure, %	14.4	14.8	
	Strain Rate, %/min	0.04	0.04	
	B-Value			
	Estimated Specific Gravity	2.7	2.7	
	Liquid Limit	33	33	
	Plastic Limit	16	16	

	Project: Purple Line	<div></div>	<div></div>	<div></div>	<div></div>
	Location: Riverdale, MD				
	Project No.: 14961-0				
	Boring No.: RD-1A				
	Sample Type: Pitcher				
	Description: Moist, Medium Stiff Reddish Brown Silty CLAY with Sand Lenses. (CL)				
Remarks: Failure along the sand lenses affected the strength of samples tested. Results inconclusive.					

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	Δ	□	
Sample No.		P-1	P-2	P-1	
Test No.		3	2	1	
Depth		50.5'-51'	51'-51.5'	51.5'-52	
Initial	Diameter, in	2.861	2.869	2.865	
	Height, in	5.663	5.96	6.05	
	Water Content, %	28.5	21.0	22.3	
	Dry Density, pcf	101.7	110.3	108.7	
	Saturation, %	116.9	107.5	109.4	
Before Shear	Void Ratio	0.658	0.528	0.55	
	Water Content, %	29.6	20.5	21.0	
	Dry Density, pcf	93.64	108.4	107.6	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.8	0.554	0.567	
Back Press., psi		124.	114.	93.98	
Ver. Eff. Cons. Stress, psi		13.99	27.99	56.02	
Shear Strength, psi		12.27	35.46	41.21	
Strain at Failure, %		5.48	1.17	1.27	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.96	0.96	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		55	55	55	
Plastic Limit		21	21	21	

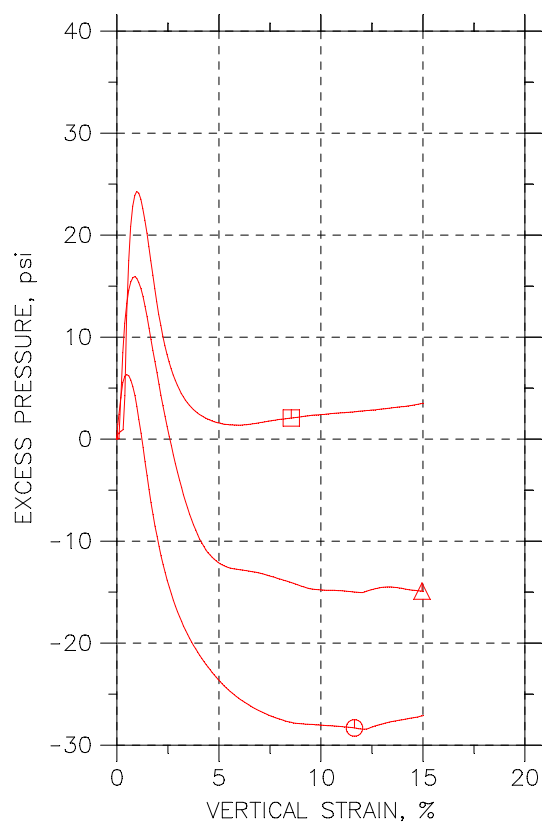
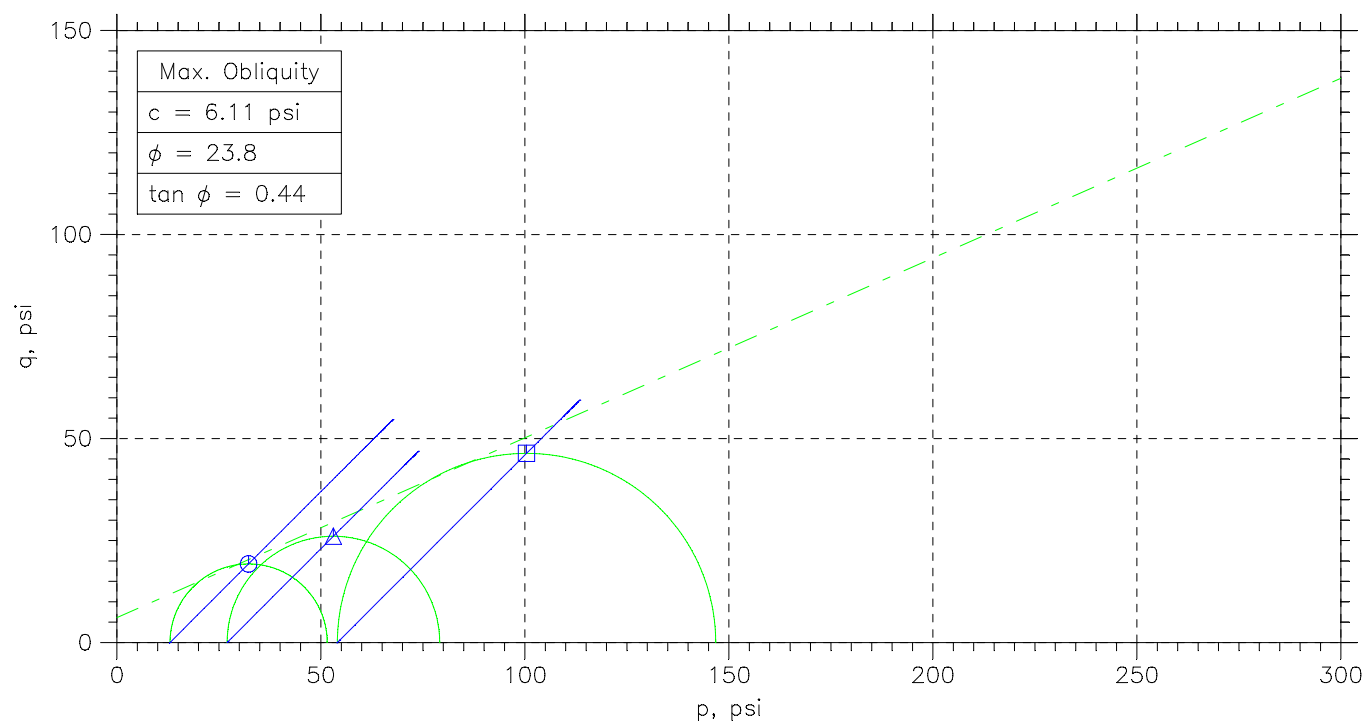


Project: Purple Line				
Location: Riverdale, MD				
Project No.: 14961-0				
Boring No.: RD-2A				
Sample Type: Pitcher				
Description: Moist, Medium Stiff, Mottled Reddish Brown CLAY. (CH)				
Remarks: Sample Location: RD-2A, P-2 @ 49'-52'				

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	△	□	
Sample No.		P-3	P-3	P-3	
Test No.		1	2	3	
Depth		44'-44.5'	43.5'-44.0'	43.0'-43.5'	
Initial	Diameter, in	2.861	2.858	2.86	
	Height, in	6.025	6.014	5.999	
	Water Content, %	18.7	19.8	18.2	
	Dry Density, pcf	109.6	111.6	111.4	
	Saturation, %	94.0	104.9	95.7	
Before Shear	Void Ratio	0.538	0.51	0.512	
	Water Content, %	18.4	20.0	17.7	
	Dry Density, pcf	112.5	109.4	114.1	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.498	0.54	0.477	
	Back Press., psi	83.99	92.04	92.01	
	Ver. Eff. Cons. Stress, psi	13.	26.96	53.99	
	Shear Strength, psi	54.66	46.9	59.41	
	Strain at Failure, %	11.6	15	8.55	
	Strain Rate, %/min	0.04	0.04	0.04	
B-Value		0.97	0.93	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		52	52	52	
Plastic Limit		17	17	17	

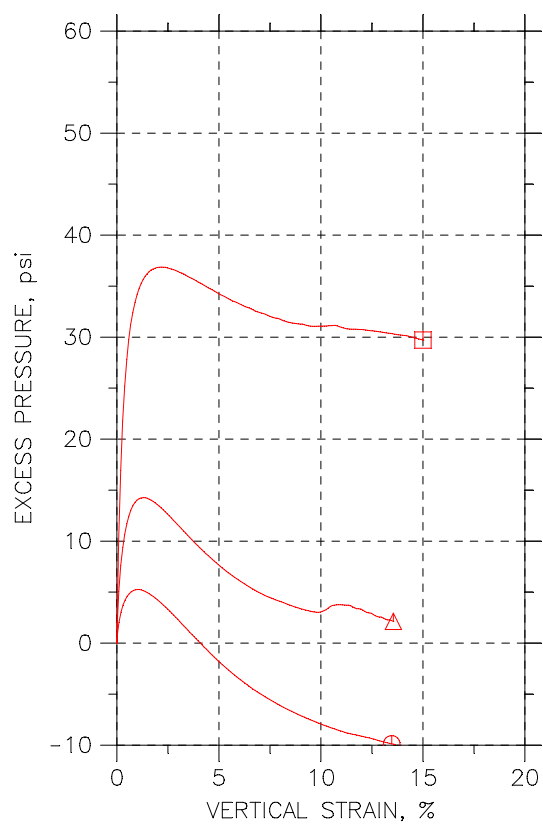
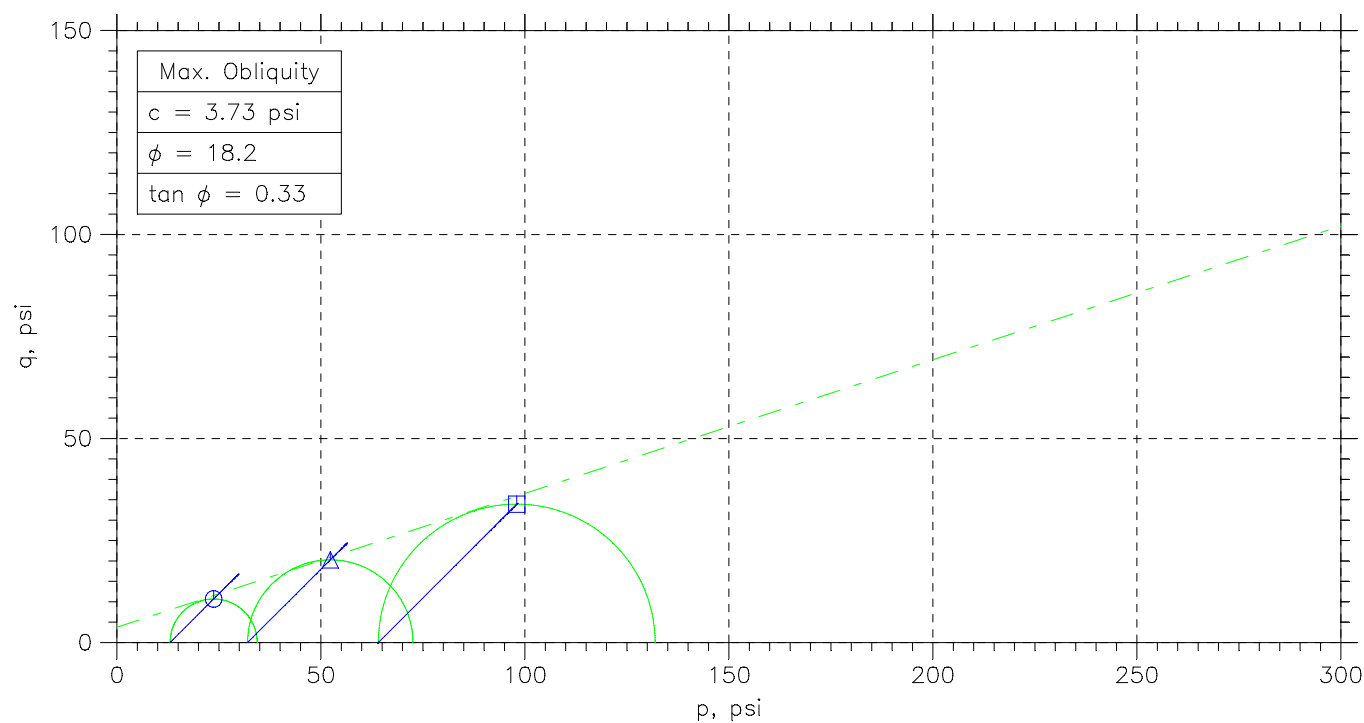


Project: Purple Line	<div></div>	<div></div>	<div></div>	<div></div>
Location: Riverdale, MD				
Project No.: 14961-0				
Boring No.: RD-3A				
Sample Type: Pitcher				
Description: Moist Medium Stiff Silty CLAY, with trace m.f rock fragments. (CH)				
Remarks: Sample Location: RD-3A, P-3 @ 42.0'-45.0'				

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	△	□	
Sample No.		P-4	P-4	P-4	
Test No.		CU3	CU2	CU1	
Depth		53'-53.5'	53.5'-54'	54.2'-54.7'	
Initial	Diameter, in	2.866	2.863	2.862	
	Height, in	5.875	5.986	6.004	
	Water Content, %	16.3	15.4	15.5	
	Dry Density, pcf	115.8	117.5	120.2	
	Saturation, %	96.6	95.9	104.4	
	Void Ratio	0.456	0.435	0.402	
Before Shear	Water Content, %	18.4	15.9	14.2	
	Dry Density, pcf	112.7	117.9	121.8	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.496	0.43	0.384	
	Back Press., psi	124.	102.	84.07	
Ver. Eff. Cons. Stress, psi		12.98	31.98	63.91	
Shear Strength, psi		16.8	24.4	34.11	
Strain at Failure, %		13.5	13.5	15	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.92	0.93	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		43	43	43	
Plastic Limit		17	17	17	

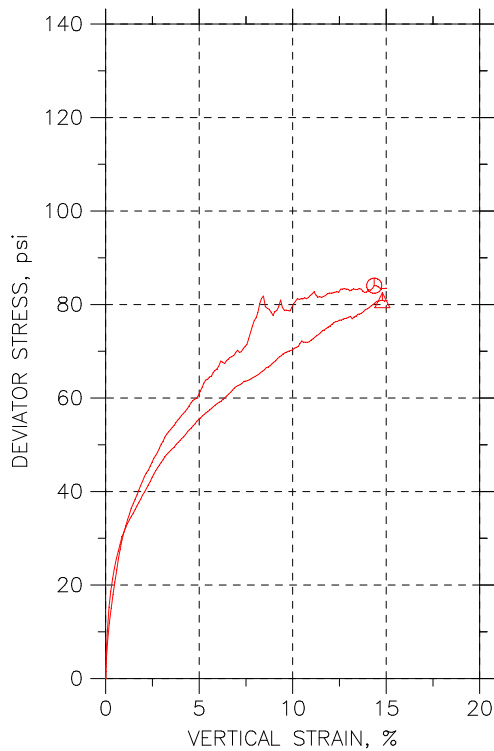
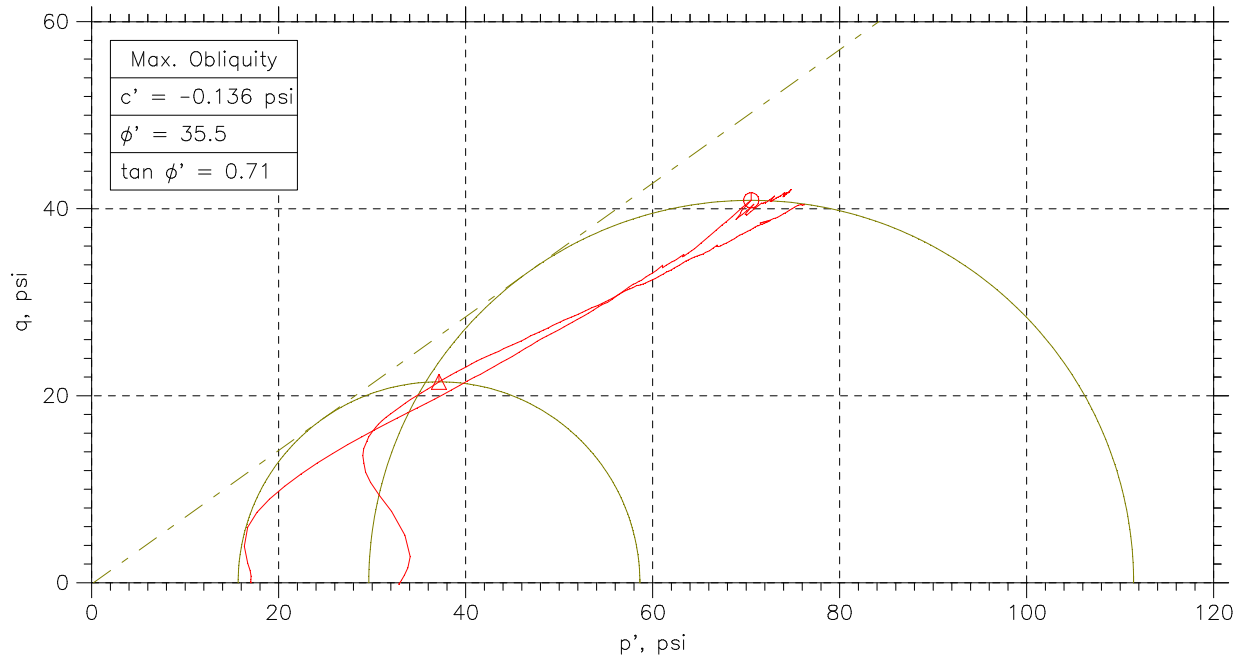


Project: Purple Line	<div></div> <div></div> <div></div> <div></div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div>
Location: Riverdale, MD				
Project No.: 14961-0				
Boring No.: RD-3A				
Sample Type: Pitcher				
Description: Moist Medium Stiff Gray CLAY with Silt Lenses, with trace m.f rock fragments. (CL)				
Remarks: Sample Location: RD-3A, P-4 @ 52'-55'				


Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



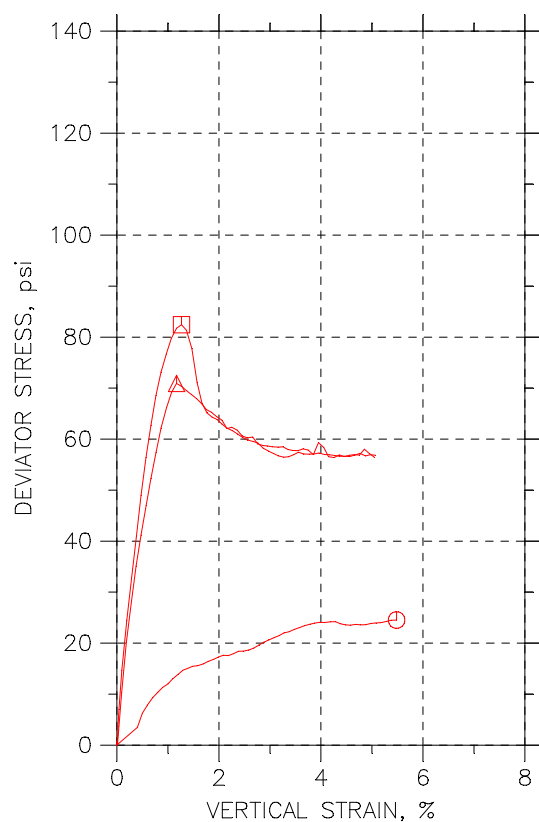
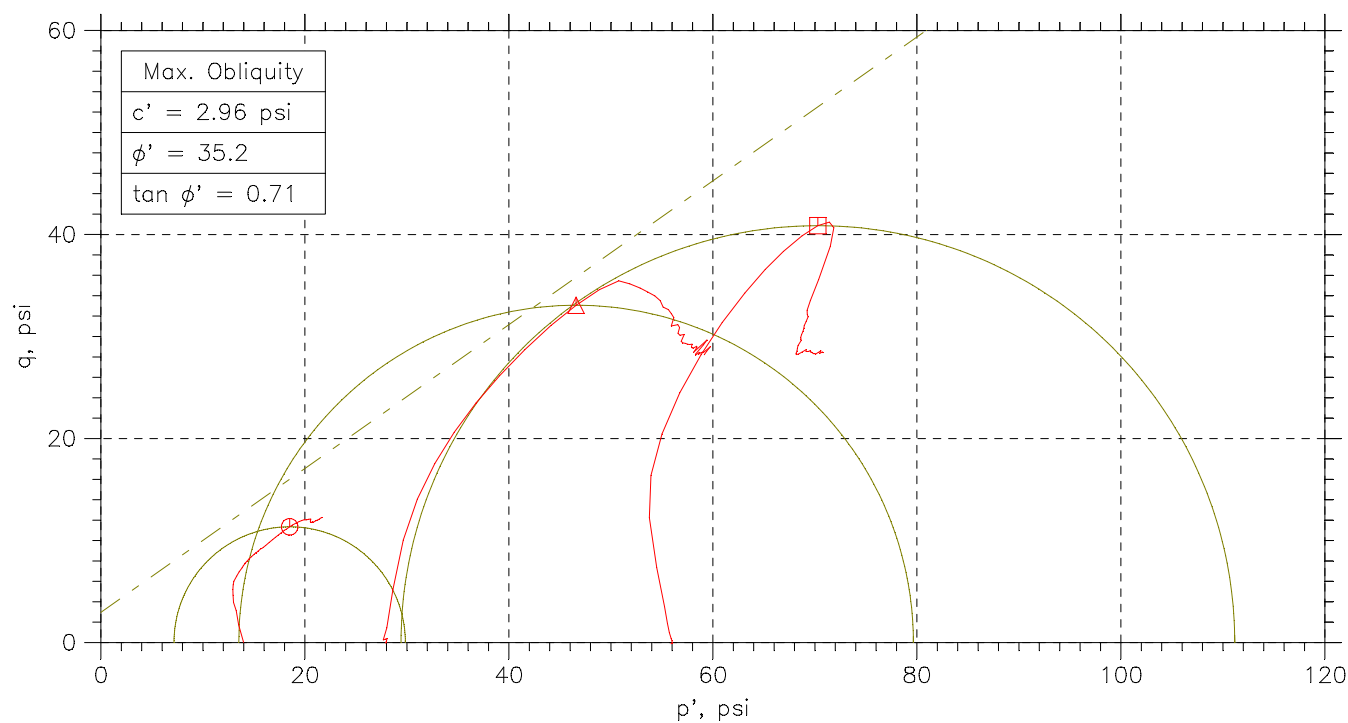
Symbol	⊙	△		
Sample No.	P-1	P-1		
Test No.	1	2		
Depth	23'-23.5'	23.5'-24'		
Initial	Diameter, in	2.01	2.01	
	Height, in	3.999	3.999	
	Water Content, %	15.6	16.4	
	Dry Density, pcf	117.2	119.9	
	Saturation, %	96.1	109.2	
Before Shear	Void Ratio	0.438	0.406	
	Water Content, %	15.3	18.5	
	Dry Density, pcf	119.2	112.5	
	Saturation*, %	100.0	100.0	
	Void Ratio	0.414	0.498	
	Back Press., psi	114.9	102.	
	Ver. Eff. Cons. Stress, psi	17.	32.97	
	Shear Strength, psi	42.01	40.46	
	Strain at Failure, %	14.4	14.8	
	Strain Rate, %/min	0.04	0.04	
	B-Value	0.96	0.96	
	Estimated Specific Gravity	2.7	2.7	
	Liquid Limit	33	33	
	Plastic Limit	16	16	

	Project: Purple Line			
	Location: Riverdale, MD			
	Project No.: 14961-0			
	Boring No.: RD-1A			
	Sample Type: Pitcher			
	Description: Moist, Medium Stiff Reddish Brown Silty CLAY with Sand Lenses. (CL)			
	Remarks: Failure along the sand lenses affected the strength of samples tested. Results inconclusive.			

Wed, 19-DEC-2007 12:04:27 Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊕	Δ	□	
Sample No.		P-1	P-2	P-1	
Test No.		3	2	1	
Depth		50.5'-51'	51'-51.5'	51.5'-52	
Initial	Diameter, in	2.861	2.869	2.865	
	Height, in	5.663	5.96	6.05	
	Water Content, %	28.5	21.0	22.3	
	Dry Density, pcf	101.7	110.3	108.7	
	Saturation, %	116.9	107.5	109.4	
Before Shear	Void Ratio	0.658	0.528	0.55	
	Water Content, %	29.6	20.5	21.0	
	Dry Density, pcf	93.64	108.4	107.6	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.8	0.554	0.567	
Back Press., psi		124.	114.	93.98	
Ver. Eff. Cons. Stress, psi		13.99	27.99	56.02	
Shear Strength, psi		12.27	35.46	41.21	
Strain at Failure, %		5.48	1.17	1.27	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.96	0.96	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		55	55	55	
Plastic Limit		21	21	21	

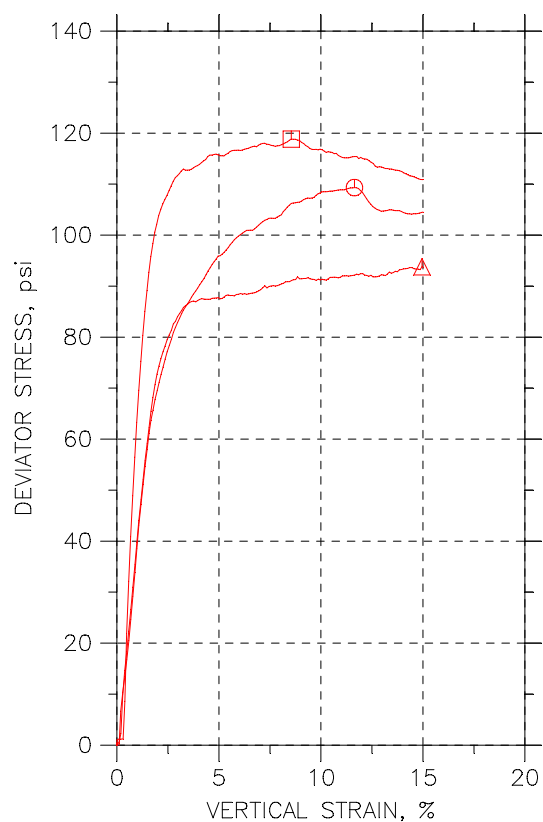
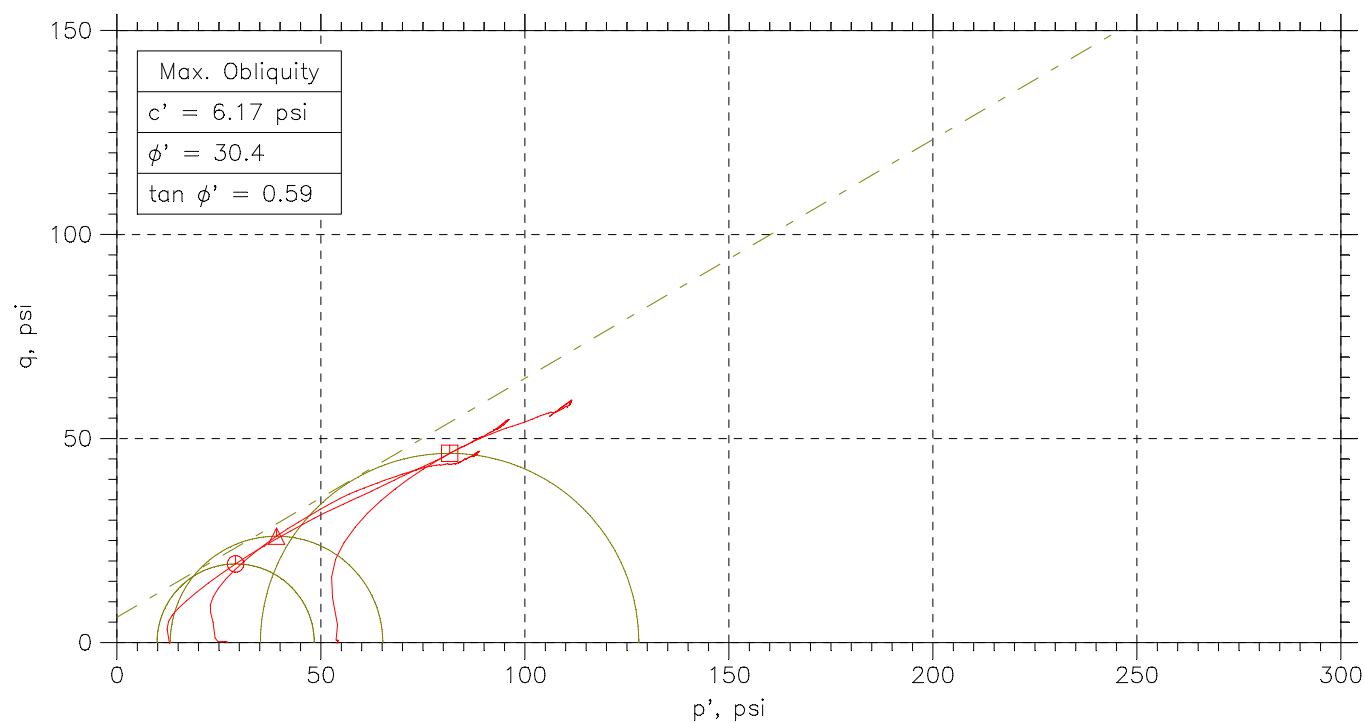


Project: Purple Line	<div></div>	<div></div>	<div></div>	<div></div>
Location: Riverdale, MD				
Project No.: 14961-0				
Boring No.: RD-2A				
Sample Type: Pitcher				
Description: Moist, Medium Stiff, Mottled Reddish Brown CLAY. (CH)				
Remarks: Sample Location: RD-2A, P-2 @ 49'-52'				

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	△	□	
Sample No.		P-3	P-3	P-3	
Test No.		1	2	3	
Depth		44'-44.5'	43.5'-44.0'	43.0'-43.5'	
Initial	Diameter, in	2.861	2.858	2.86	
	Height, in	6.025	6.014	5.999	
	Water Content, %	18.7	19.8	18.2	
	Dry Density, pcf	109.6	111.6	111.4	
	Saturation, %	94.0	104.9	95.7	
Before Shear	Void Ratio	0.538	0.51	0.512	
	Water Content, %	18.4	20.0	17.7	
	Dry Density, pcf	112.5	109.4	114.1	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.498	0.54	0.477	
Back Press., psi		83.99	92.04	92.01	
Ver. Eff. Cons. Stress, psi		13.	26.96	53.99	
Shear Strength, psi		54.66	46.9	59.41	
Strain at Failure, %		11.6	15	8.55	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.97	0.93	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		52	52	52	
Plastic Limit		17	17	17	



Project: Purple Line

Location: Riverdale, MD

Project No.: 14961-0

Boring No.: RD-3A

Sample Type: Pitcher

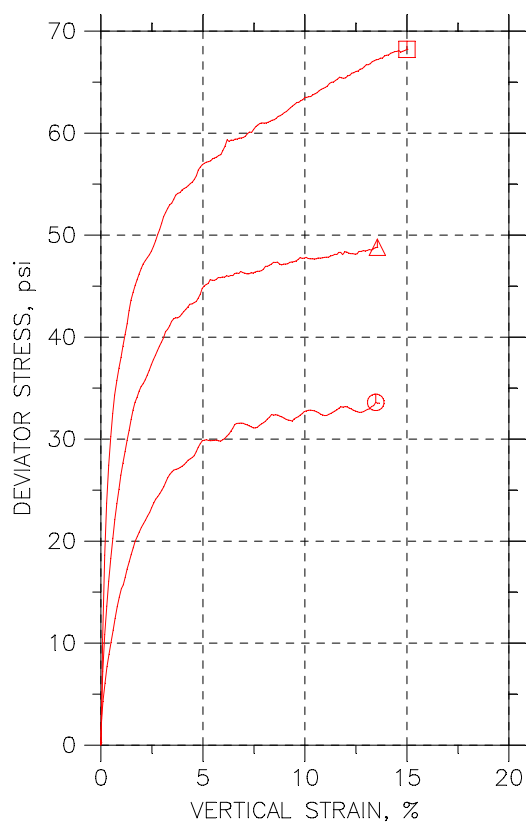
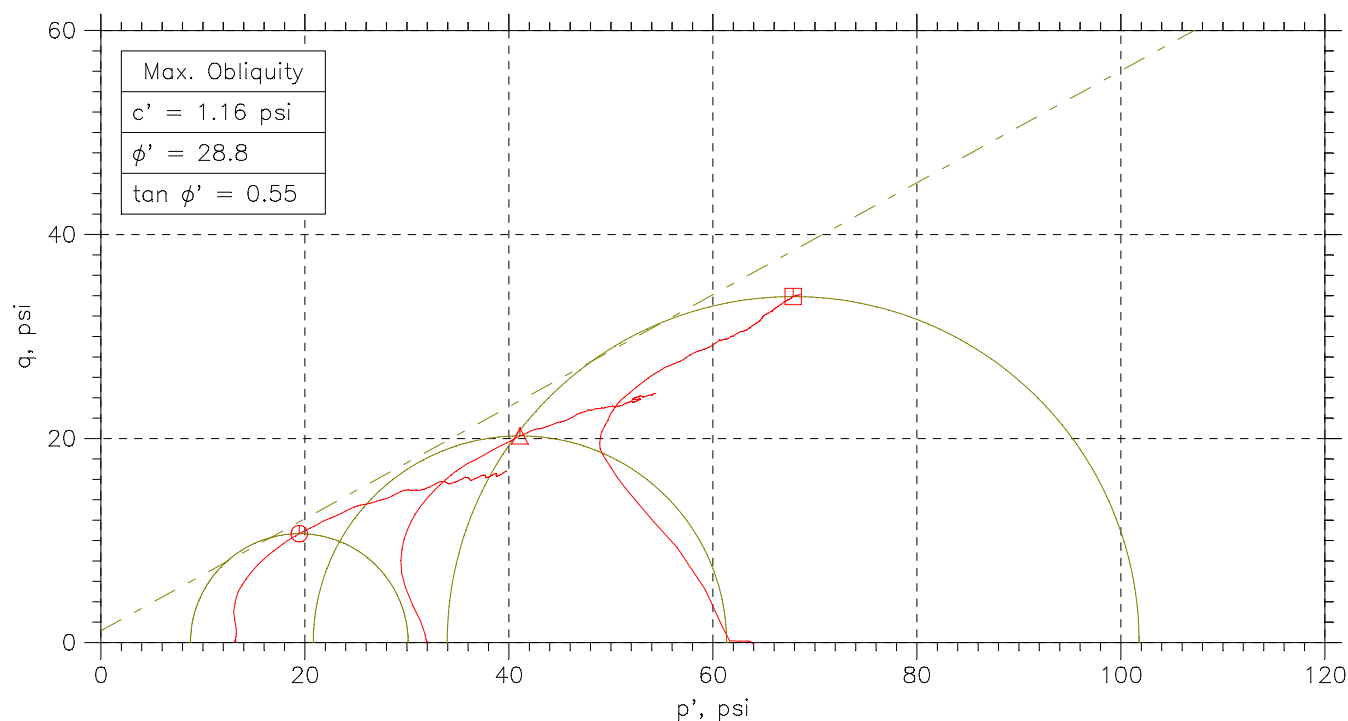
Description: Moist Medium Stiff Silty CLAY, with trace m.f rock fragments. (CH)

Remarks: Sample Location: RD-3A, P-3 @ 42.0'-45.0'

Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Symbol		⊙	△	□	
Sample No.		P-4	P-4	P-4	
Test No.		CU3	CU2	CU1	
Depth		53'-53.5'	53.5'-54'	54.2'-54.7'	
Initial	Diameter, in	2.866	2.863	2.862	
	Height, in	5.875	5.986	6.004	
	Water Content, %	16.3	15.4	15.5	
	Dry Density, pcf	115.8	117.5	120.2	
	Saturation, %	96.6	95.9	104.4	
	Void Ratio	0.456	0.435	0.402	
Before Shear	Water Content, %	18.4	15.9	14.2	
	Dry Density, pcf	112.7	117.9	121.8	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.496	0.43	0.384	
	Back Press., psi	124.	102.	84.07	
Ver. Eff. Cons. Stress, psi		12.98	31.98	63.91	
Shear Strength, psi		16.8	24.4	34.11	
Strain at Failure, %		13.5	13.5	15	
Strain Rate, %/min		0.04	0.04	0.04	
B-Value		0.92	0.93	0.96	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		43	43	43	
Plastic Limit		17	17	17	



Project: Purple Line	<div></div> <div></div> <div></div> <div></div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div>	<div></div> <div></div> <div></div> <div></div> <div></div>
Location: Riverdale, MD				
Project No.: 14961-0				
Boring No.: RD-3A				
Sample Type: Pitcher				
Description: Moist Medium Stiff Gray CLAY with Silt Lenses, with trace m.f rock fragments. (CL)				
Remarks: Sample Location: RD-3A, P-4 @ 52'-55'				

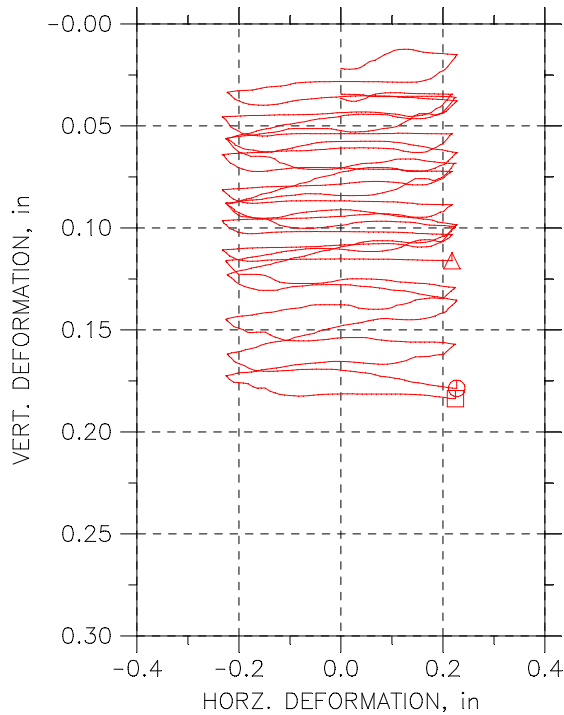
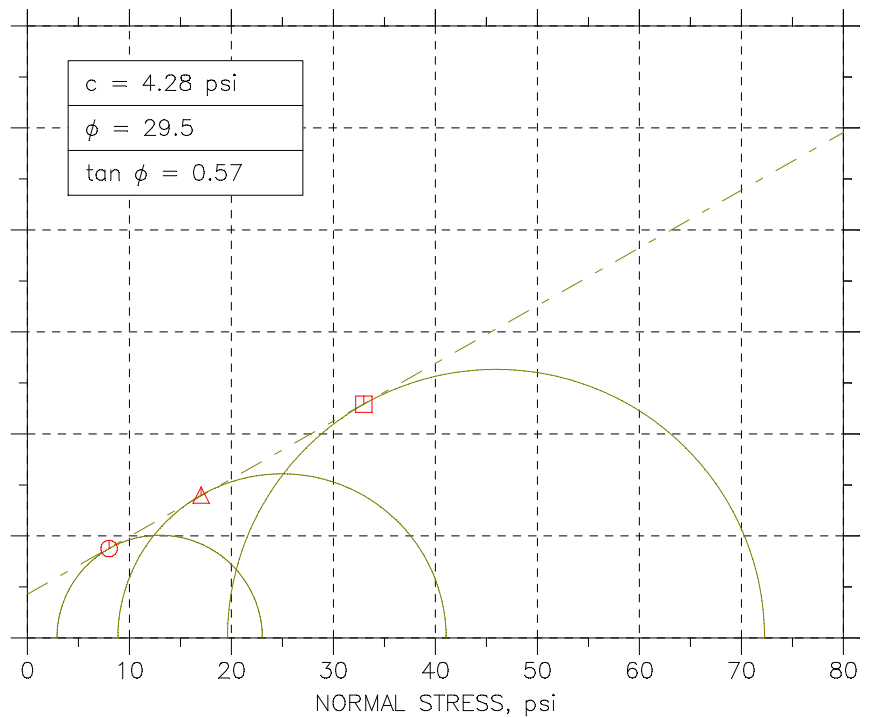
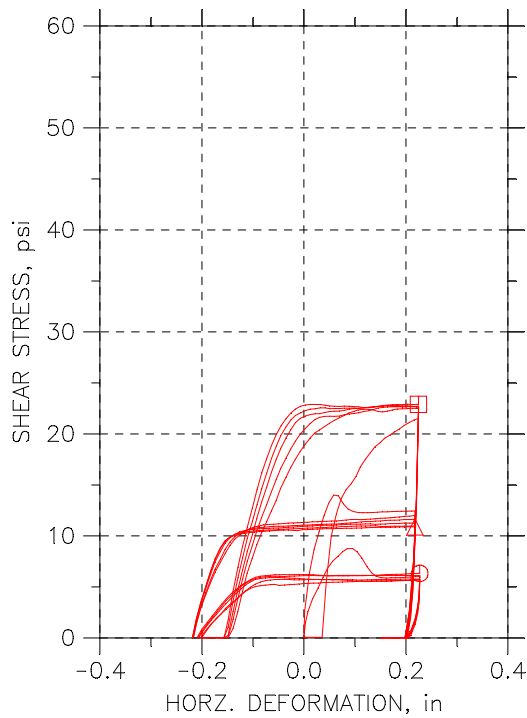
Phase calculations based on start and end of test.

* Saturation is set to 100% for phase calculations.



DIRECT SHEAR TEST RESULTS

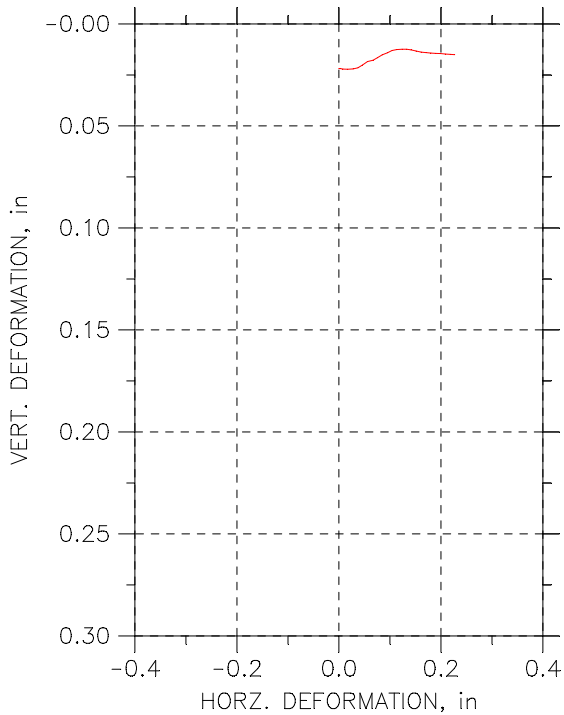
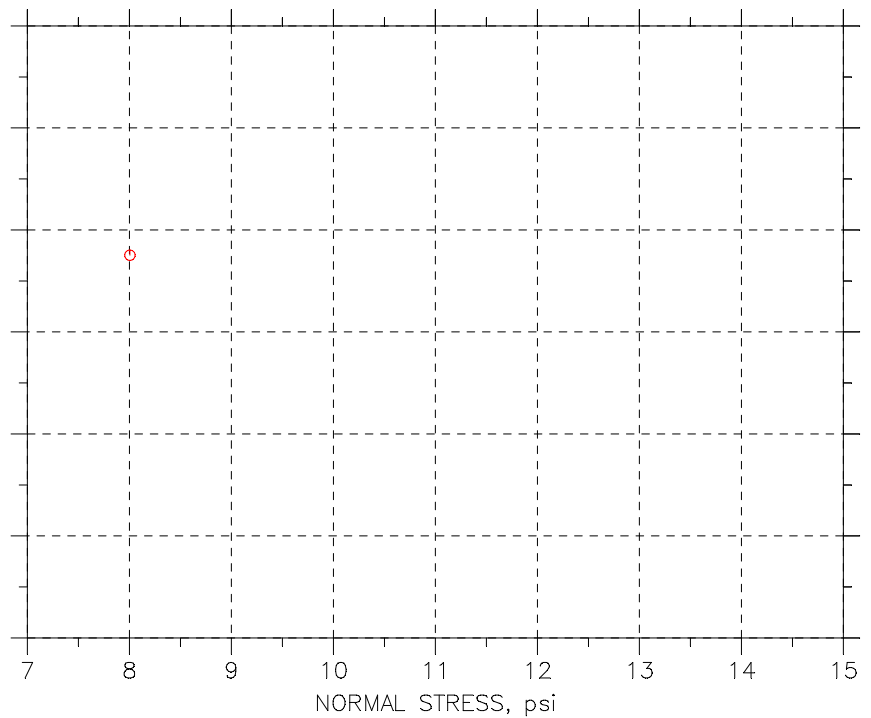
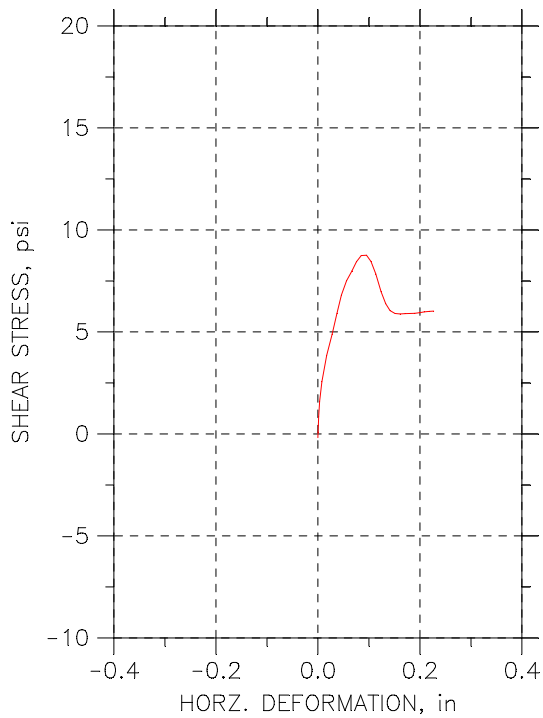
DIRECT SHEAR TEST REPORT



Symbol	⊖	△	□	
Test No.	1	2	3	
Sample No.	P-1	P-1	P-1	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	38.91	22.85	24.18
	Dry Density, pcf	96.837	107.83	108.18
	Saturation, %	141.84	109.54	116.96
	Void Ratio	0.74061	0.56315	0.55815
Consol. Height, in		0.97807	0.96348	0.96563
Consol. Void Ratio		0.70243	0.50606	0.5046
Final	Water Content, %	18.76	20.65	20.58
	Dry Density, pcf	117.9	121.99	132.52
	Saturation, %	117.88	146.04	204.35
	Void Ratio	0.42963	0.38171	0.27192
Normal Stress, psi		8.0044	17.036	32.977
Shear Stress, psi		8.7613	14.003	22.913
Ult. Shear Stress, psi		6.3267	10.881	22.905
Time to Failure, min		10.003	7.0035	515.33
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		33	33	33
Plastic Limit		16	16	16
Plasticity Index		17	17	17

Project: Purple Line	
Location: Riverdale, MD	
Project No.: 14961	
Boring No.: RD-1A	
Sample Type: pitcher	
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)	
Remarks: Residual Direct Shear	

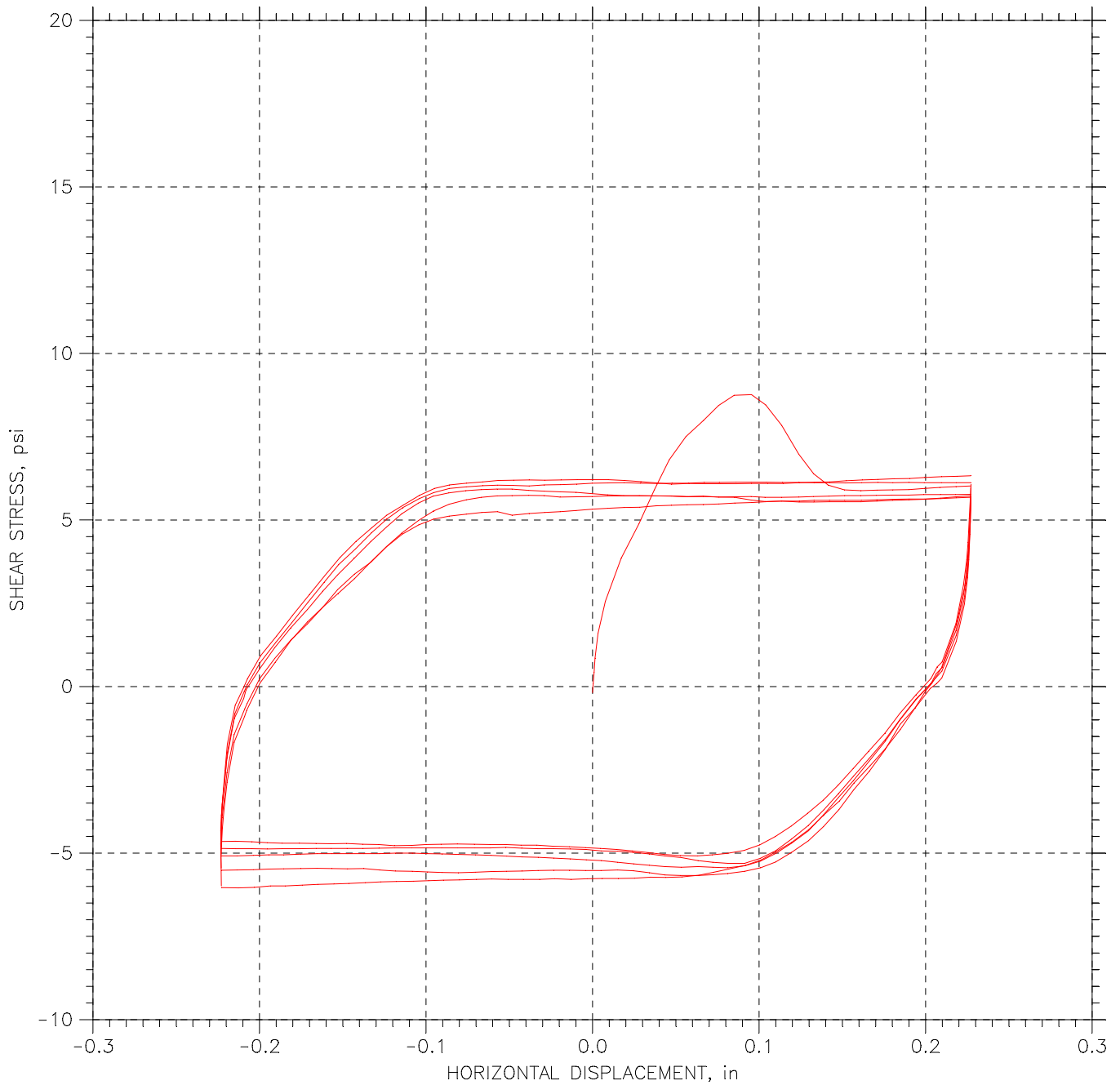
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	1			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	38.91		
	Dry Density, pcf	96.84		
	Saturation, %	141.84		
	Void Ratio	0.74061		
Consol. Height, in		0.97807		
Consol. Void Ratio		0.70243		
Final	Water Content, %	18.76		
	Dry Density, pcf	117.9		
	Saturation, %	117.88		
	Void Ratio	0.42963		
Normal Stress, psi		8.0044		
Max. Shear Stress, psi		8.7613		
Ult. Shear Stress, psi		6.0203		
Time to Failure, min		10.003		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		33		
Plastic Limit		16		
Plasticity Index		17		

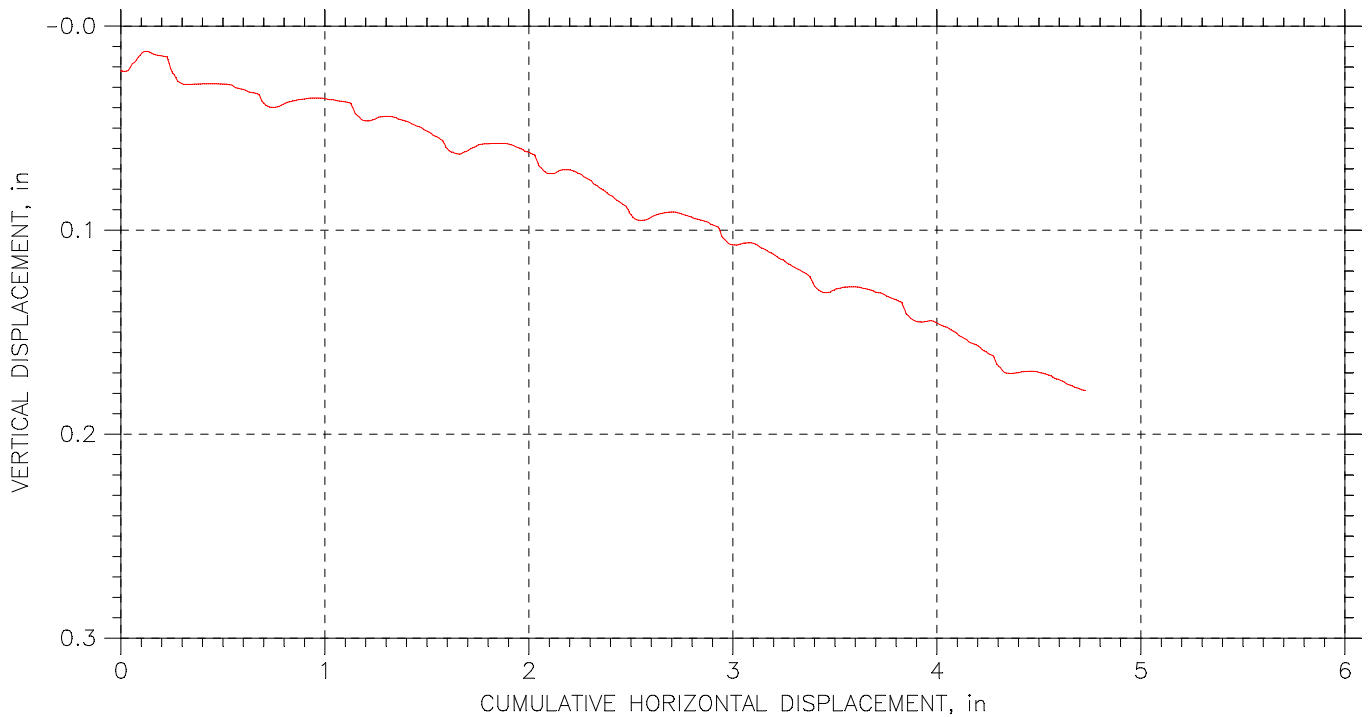
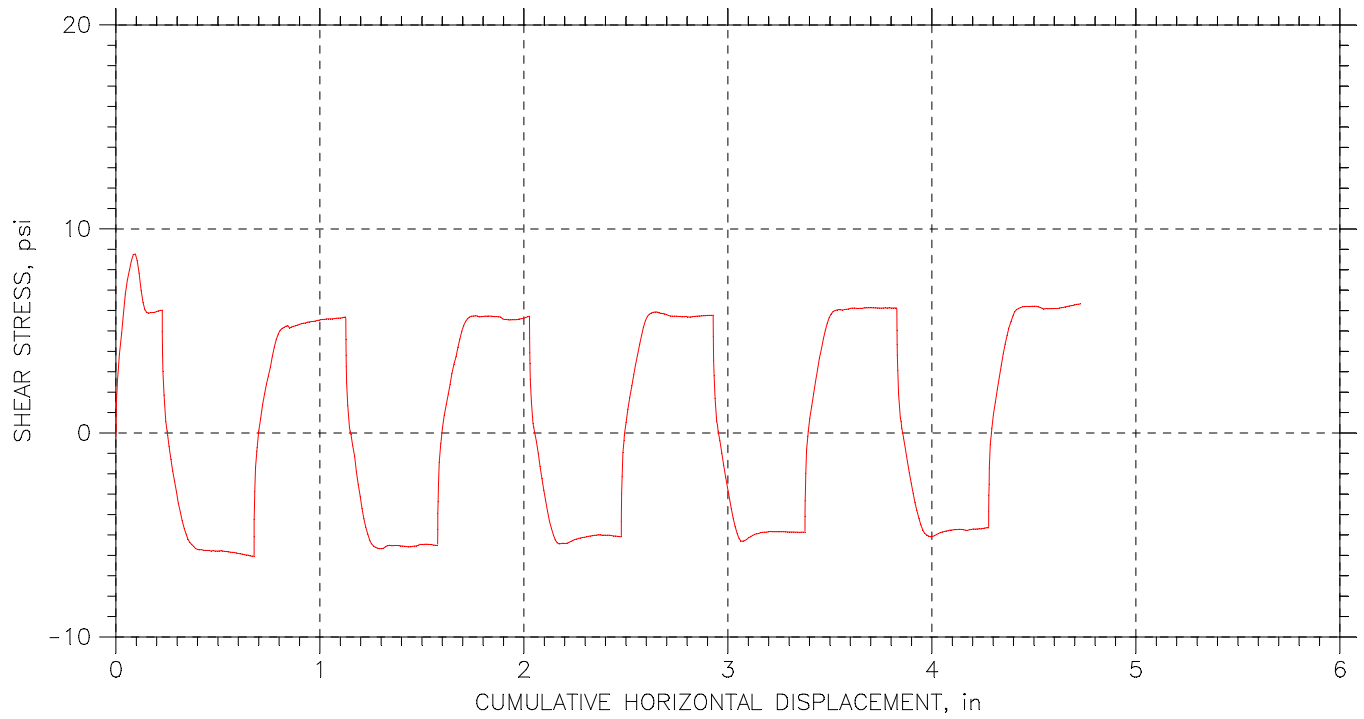
Project: Purple Line	
Location: Riverdale, MD	
Project No.: 14961	
Boring No.: RD-1A	
Sample Type: pitcher	
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)	
Remarks: Residual Direct Shear	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-1A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/28/07	Depth: 22.75'
Test No.: 1	Sample Type: pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



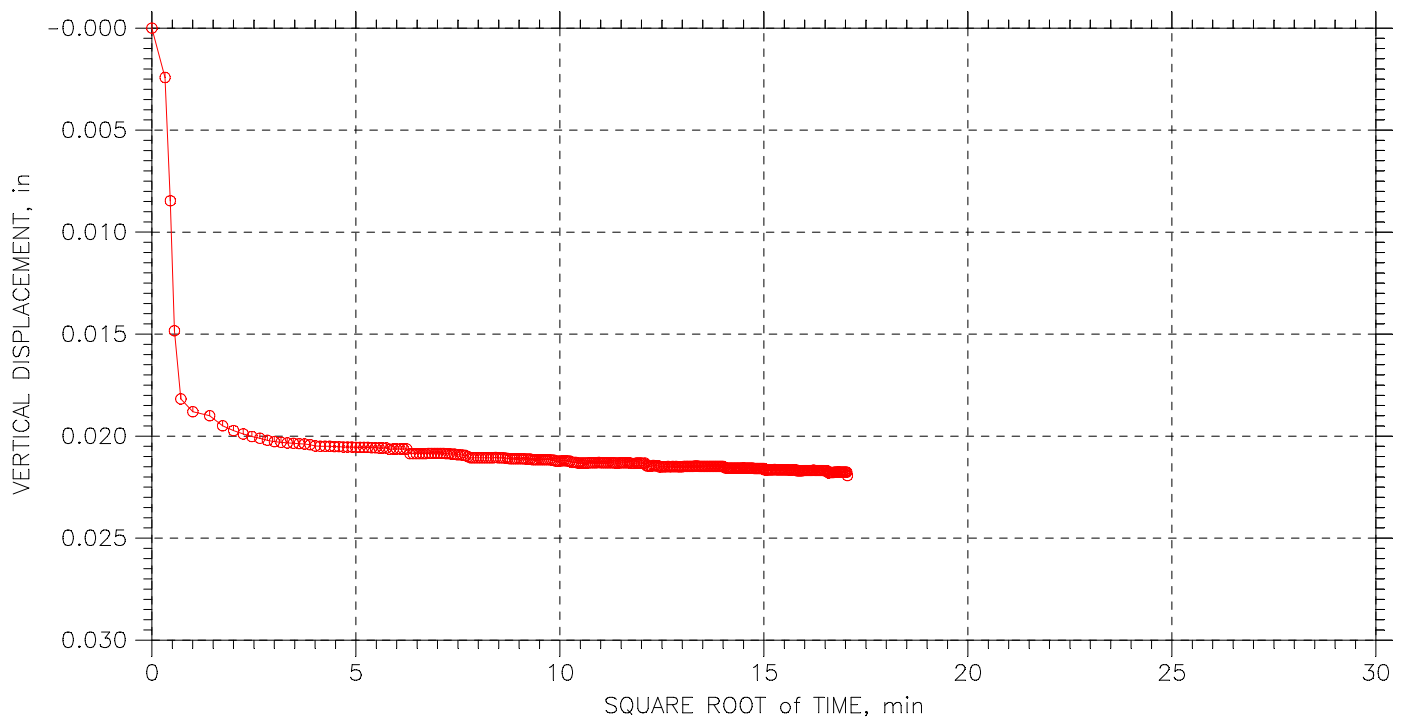
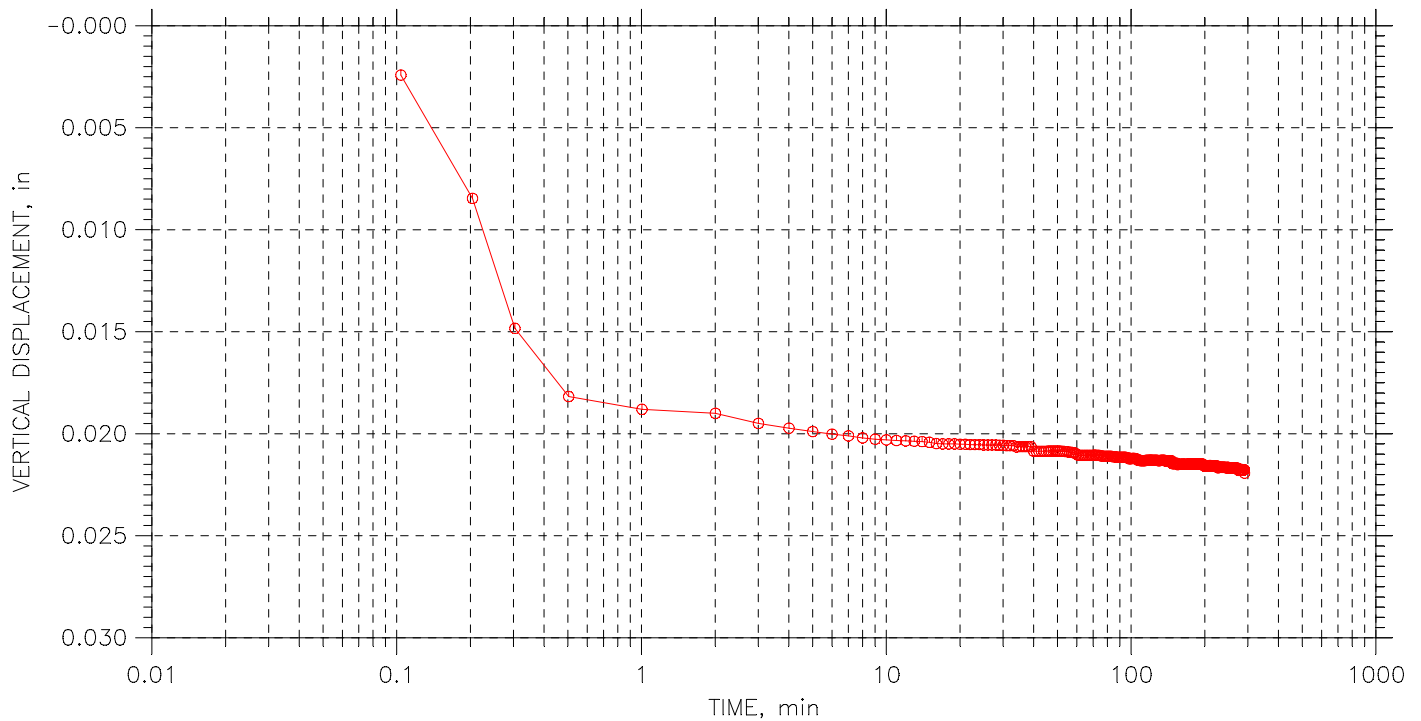
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-1A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/28/07	Depth: 22.75'
Test No.: 1	Sample Type: pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

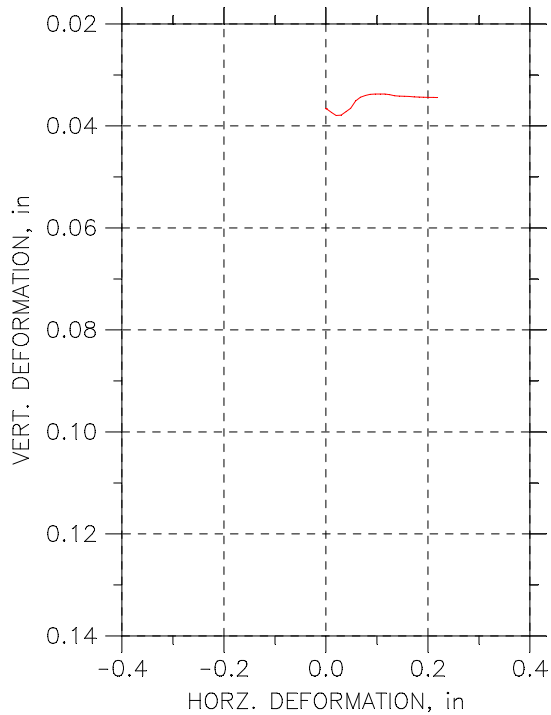
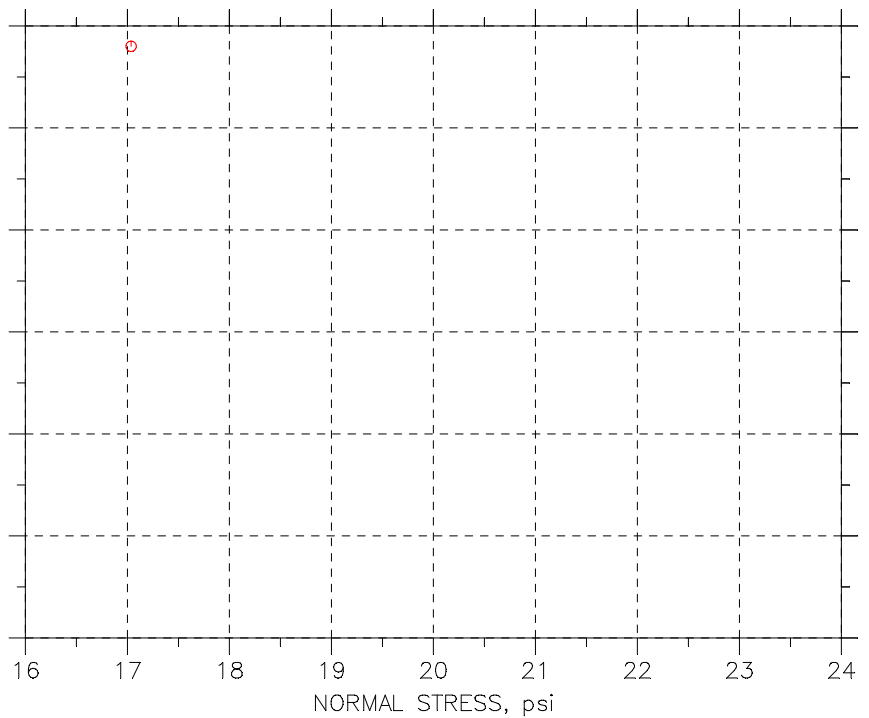
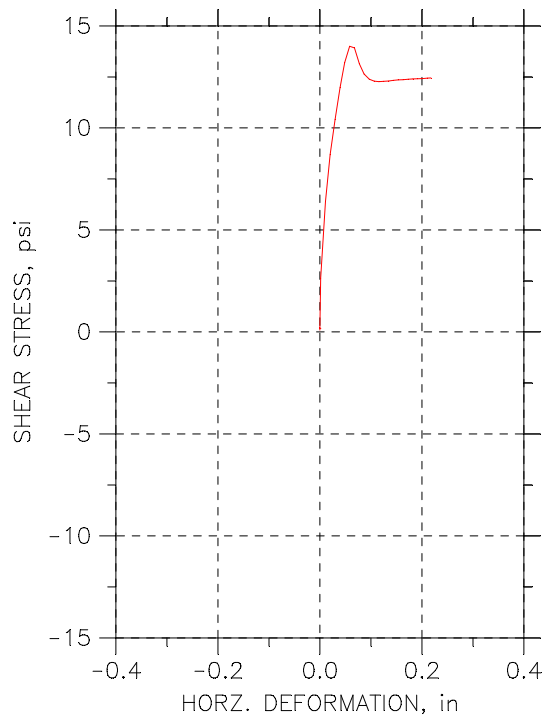
Step: 1 of 1

Stress: 8 psi



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-1A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/28/07	Depth: 22.75'
Test No.: 1	Sample Type: pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

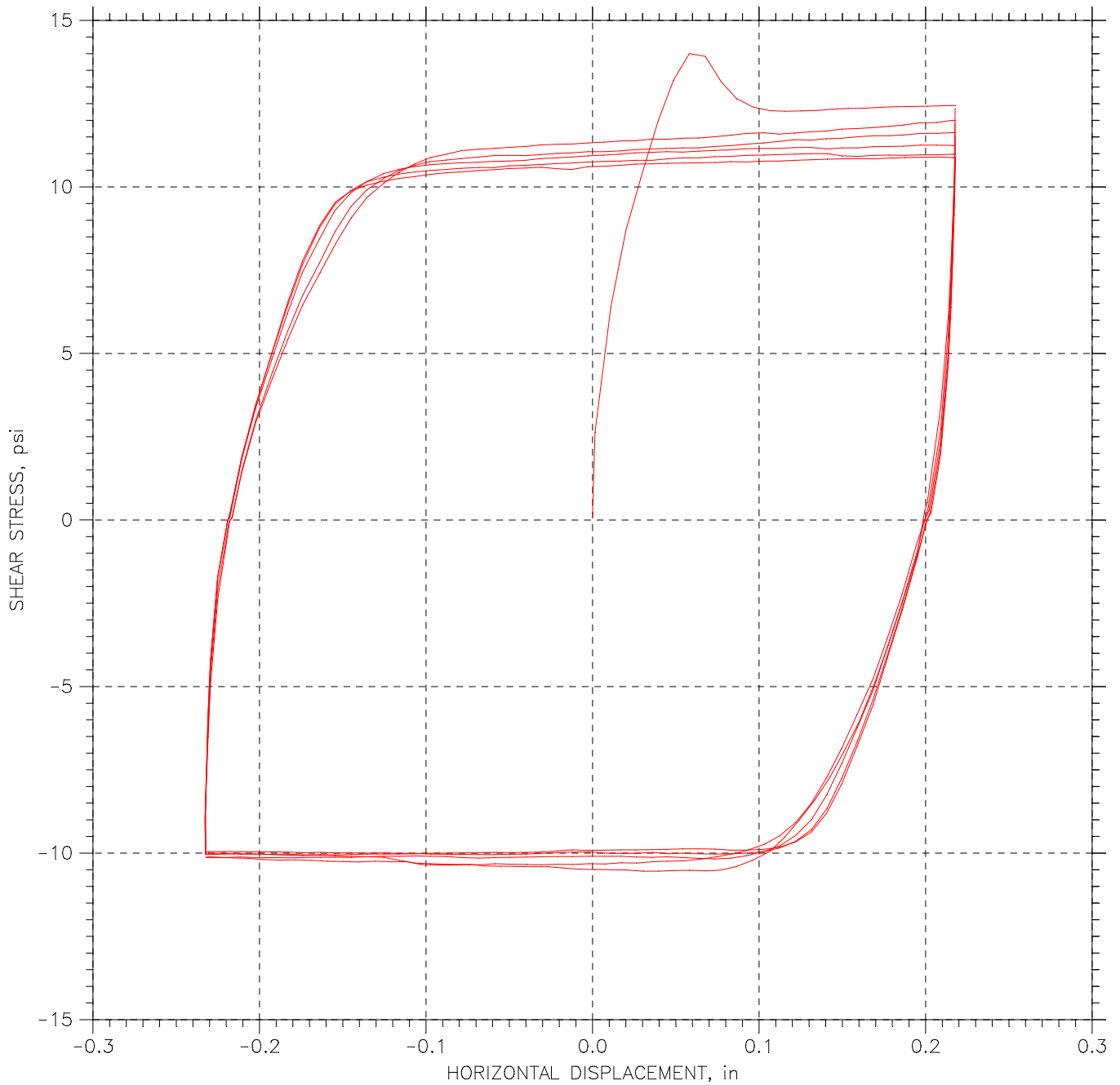
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	2			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	22.85		
	Dry Density, pcf	107.8		
	Saturation, %	109.54		
	Void Ratio	0.56315		
Consol. Height, in		0.96348		
Consol. Void Ratio		0.50606		
Final	Water Content, %	20.65		
	Dry Density, pcf	122.		
	Saturation, %	146.04		
	Void Ratio	0.38171		
Normal Stress, psi		17.036		
Max. Shear Stress, psi		14.003		
Ult. Shear Stress, psi		12.446		
Time to Failure, min		7.0035		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		33		
Plastic Limit		16		
Plasticity Index		17		

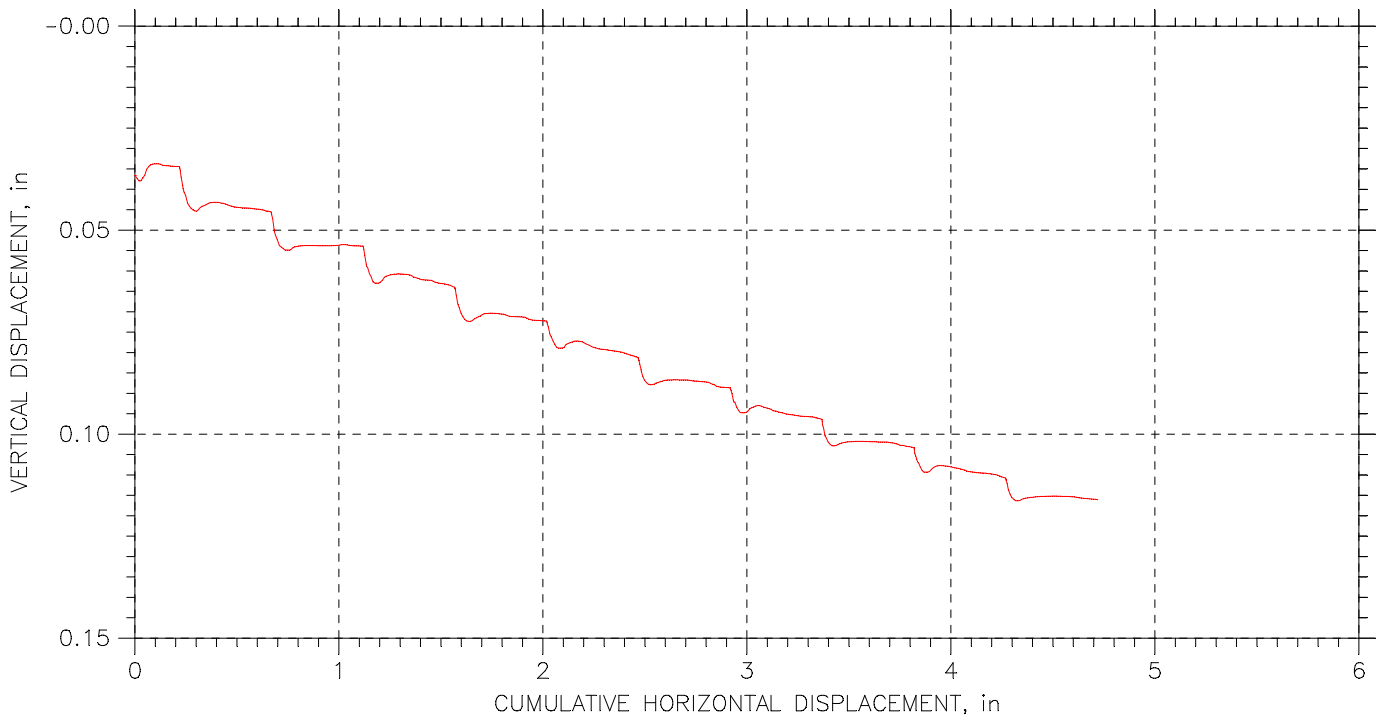
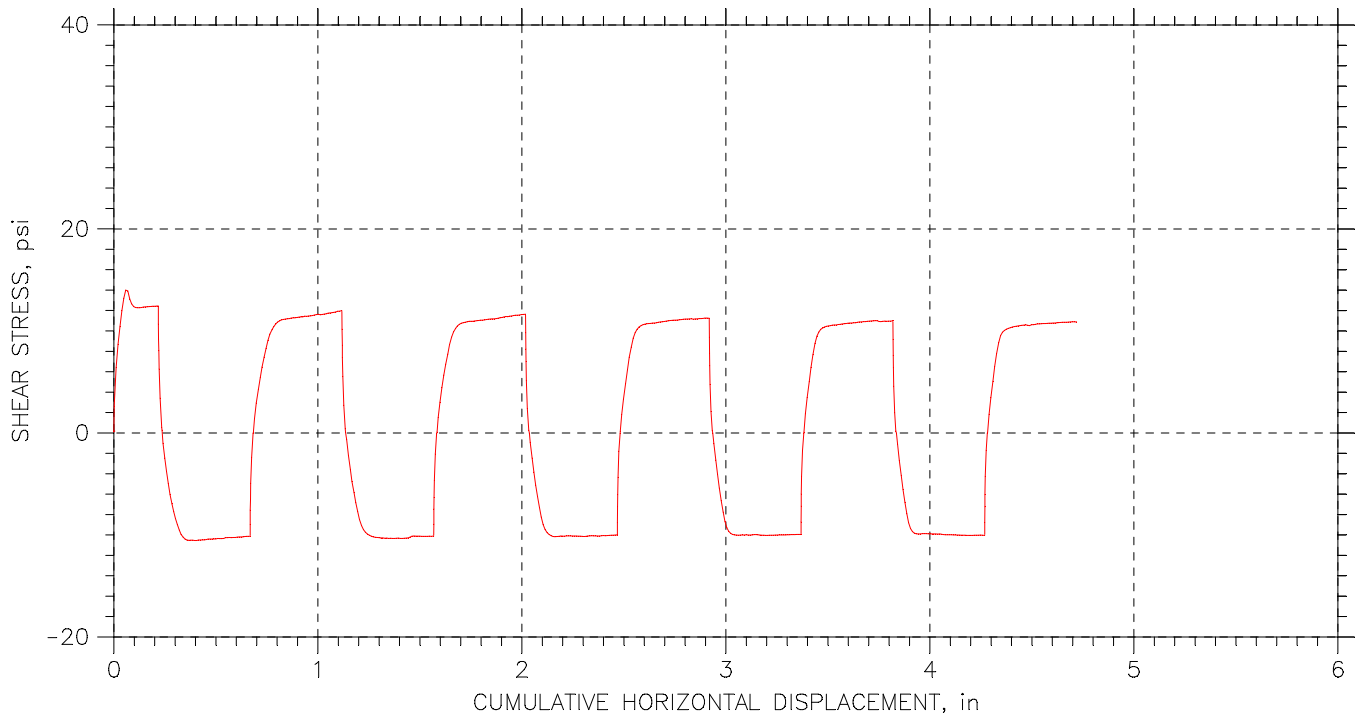
Project: Purple Line	
Location: Riverdale	
Project No.: 14961	
Boring No.: RD-1A	
Sample Type: Pitcher	
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)	
Remarks: Residual Direct Shear	

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale	Project No.: 14961
Boring No.: RD-1A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/30/07	Depth: 22.9'
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



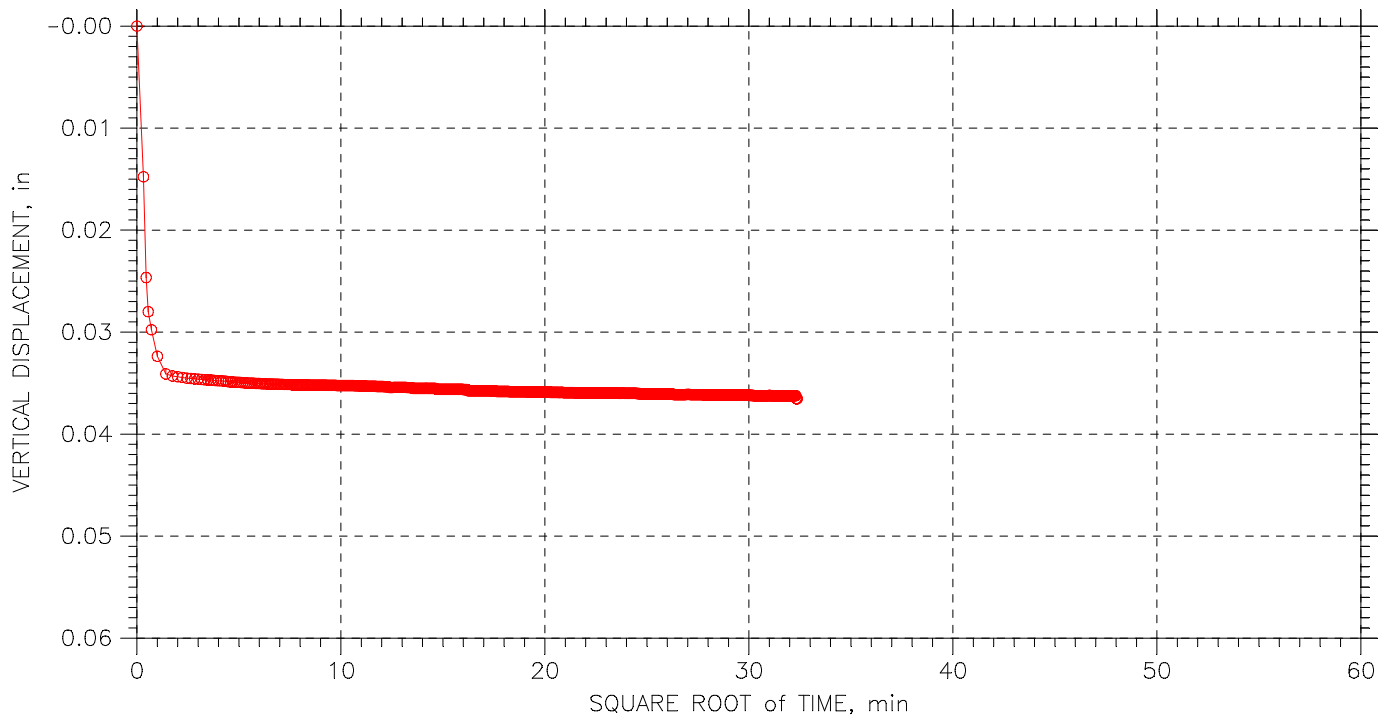
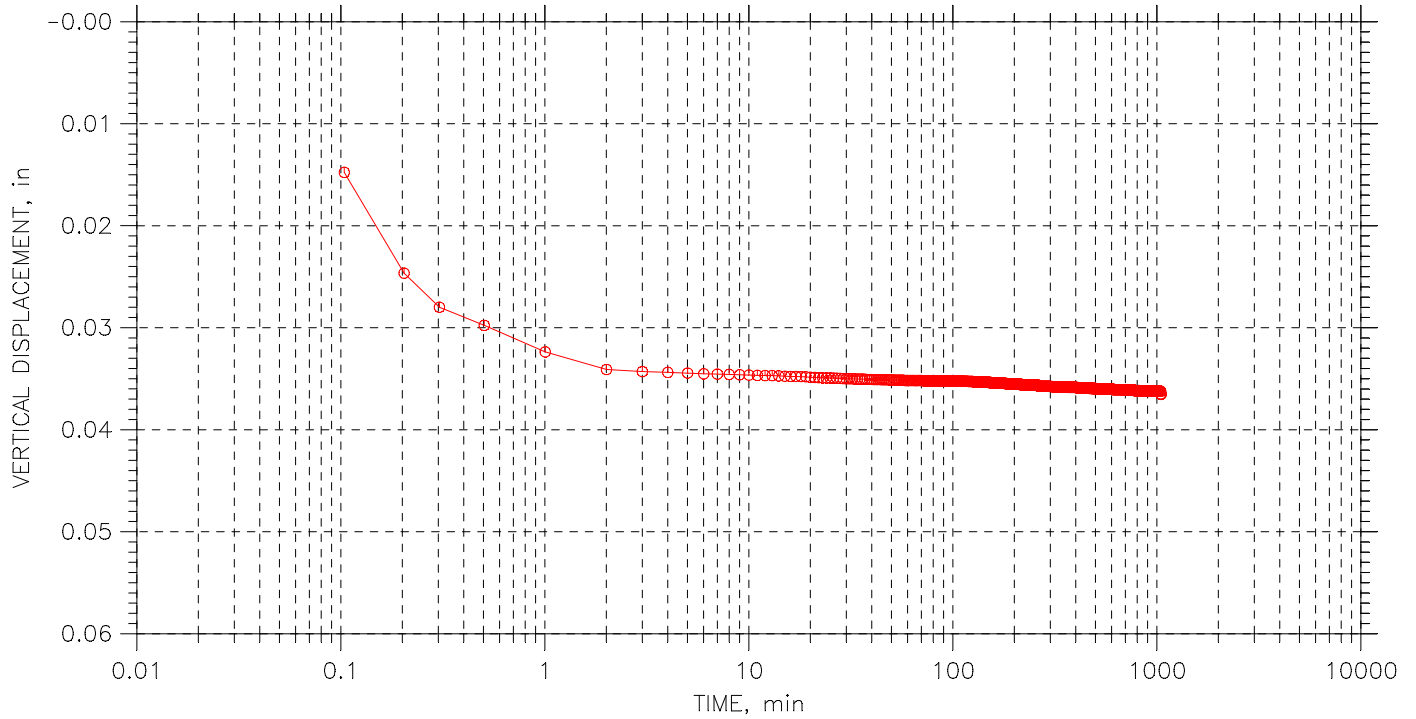
Project: Purple Line	Location: Riverdale	Project No.: 14961
Boring No.: RD-1A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/30/07	Depth: 22.9'
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

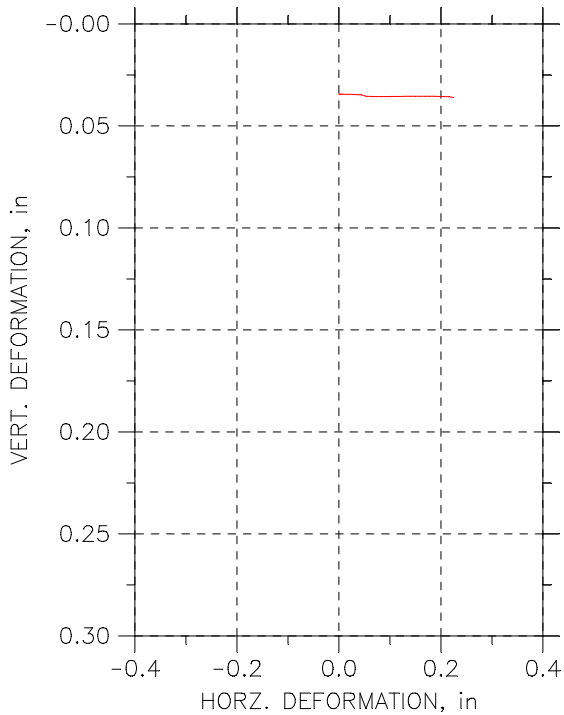
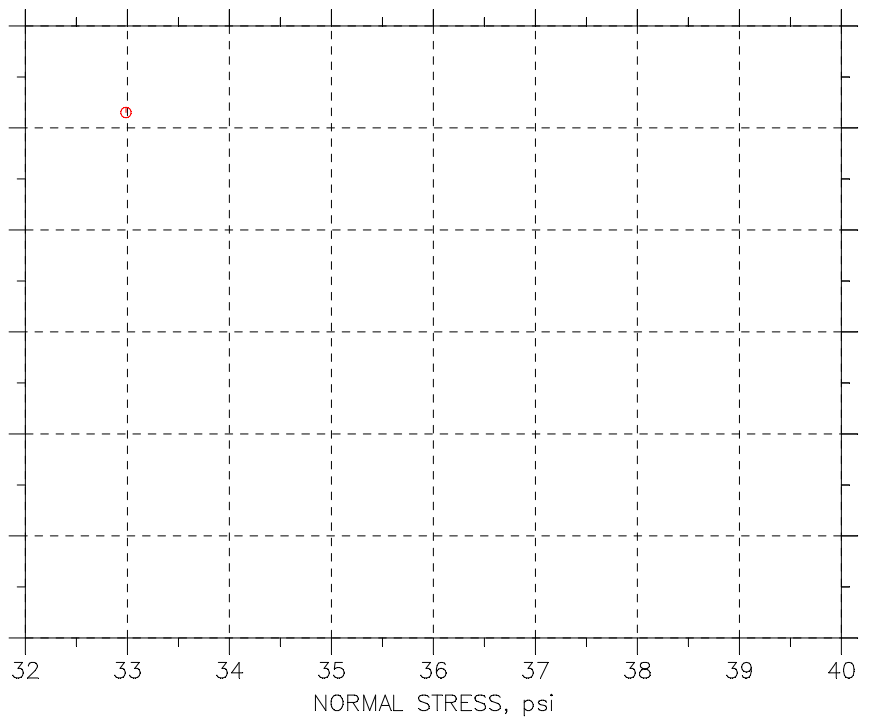
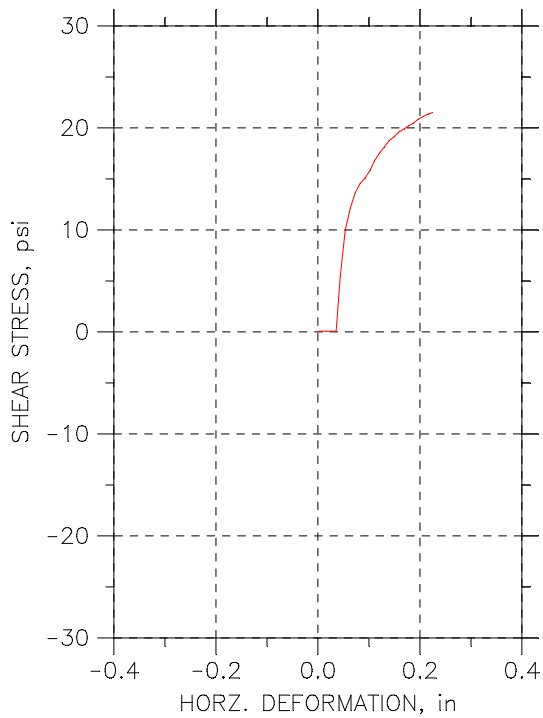
Step: 1 of 1

Stress: 17 psi



Project: Purple Line	Location: Riverdale	Project No.: 14961
Boring No.: RD-1A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/30/07	Depth: 22.9'
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

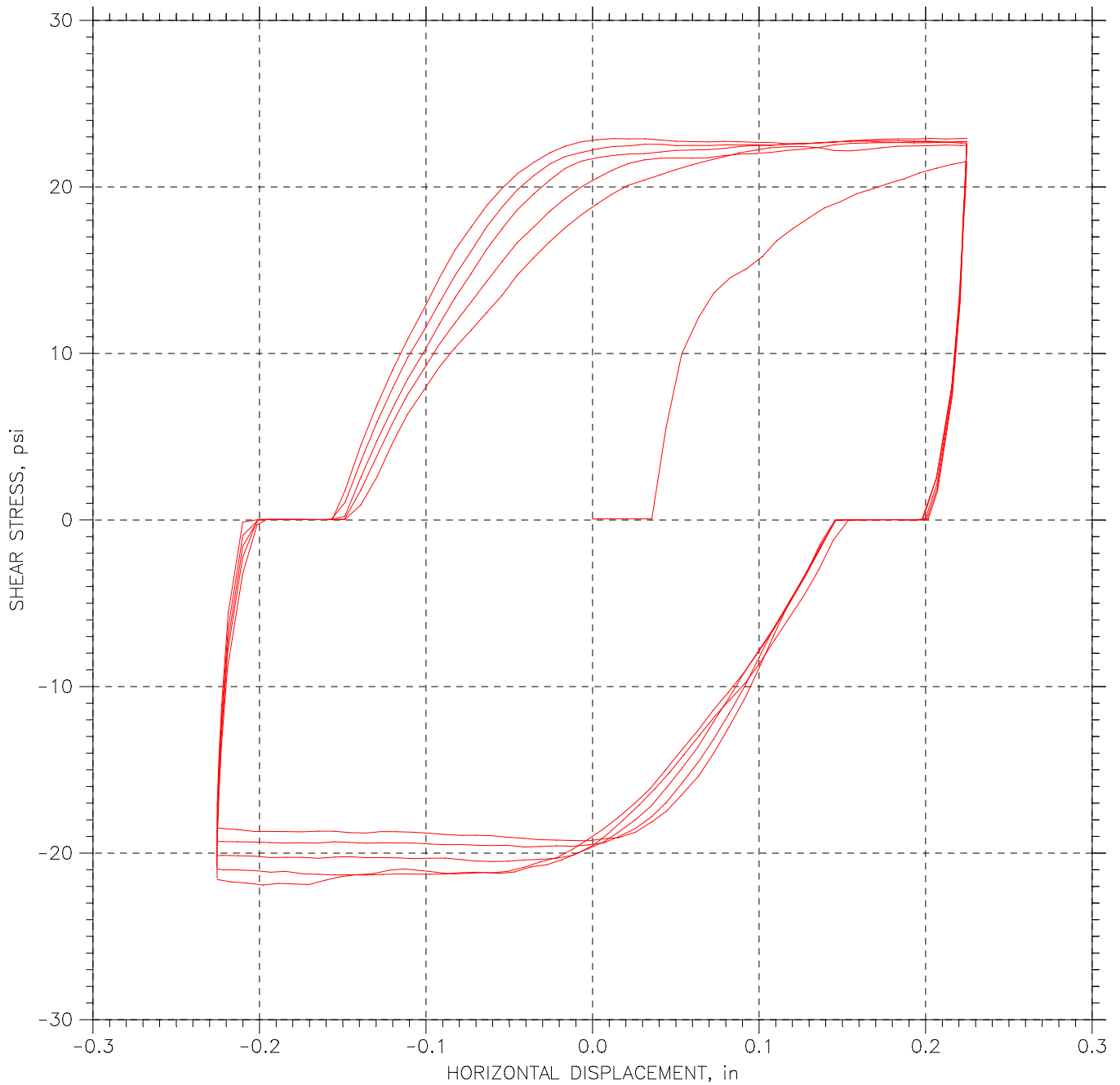
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	3			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	24.18		
	Dry Density, pcf	108.2		
	Saturation, %	116.96		
	Void Ratio	0.55815		
Consol. Height, in		0.96563		
Consol. Void Ratio		0.5046		
Final	Water Content, %	20.58		
	Dry Density, pcf	132.5		
	Saturation, %	204.35		
	Void Ratio	0.27192		
Normal Stress, psi		32.985		
Max. Shear Stress, psi		21.514		
Ult. Shear Stress, psi		21.514		
Time to Failure, min		23.877		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		33		
Plastic Limit		16		
Plasticity Index		17		

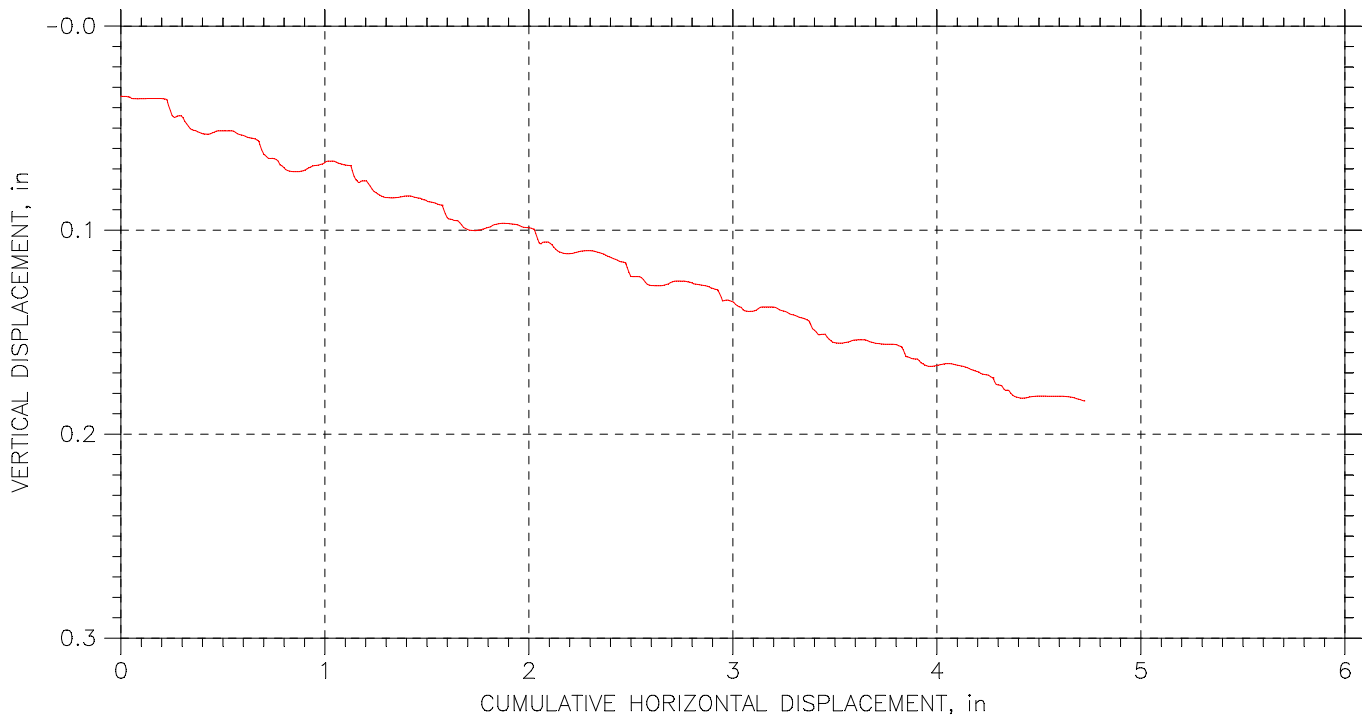
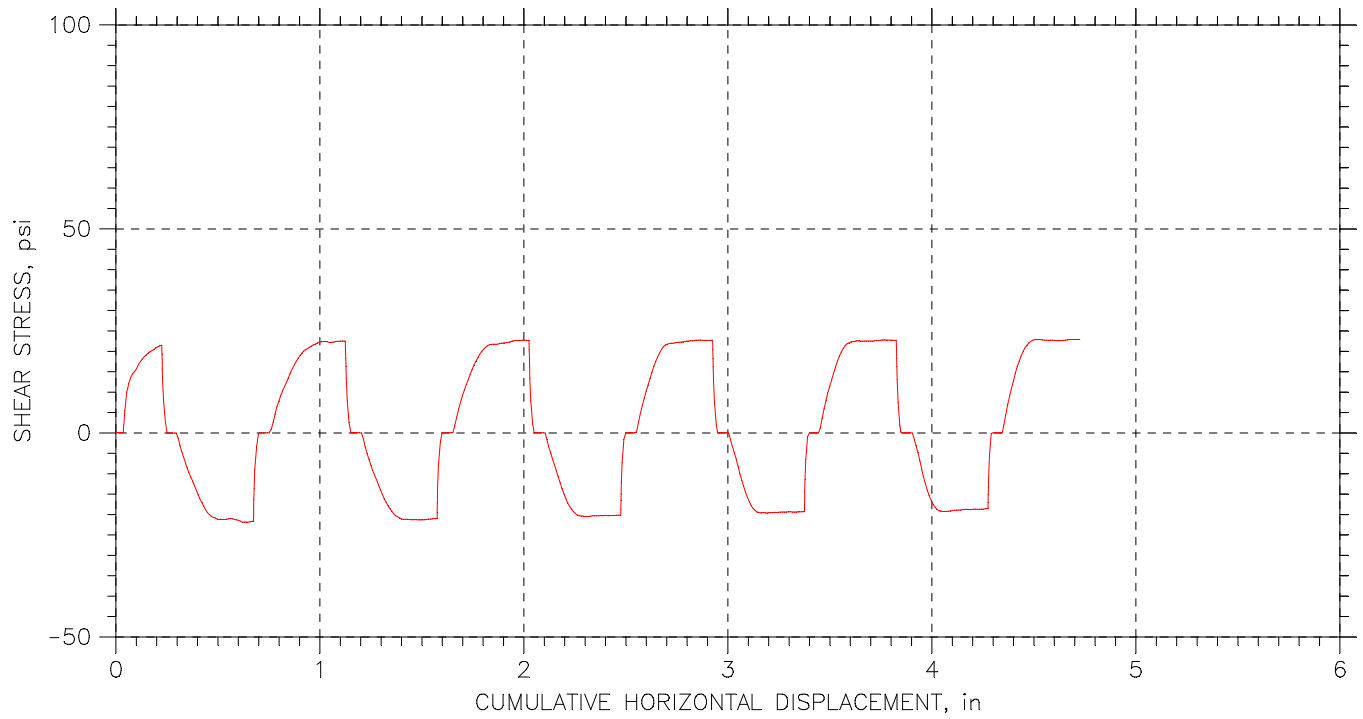
Project: Purple Line	Disp. Rate, in/min	0.01			
Location: Riverdale, MD	Estimated Specific Gravity	2.70			
Project No.: 14961	Liquid Limit	33			
Boring No.: RD-1A	Plastic Limit	16			
Sample Type: Pitcher	Plasticity Index	17			
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)					
Remarks: Residual Direct Shear					

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-1A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/30/07	Depth: 23.0'
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



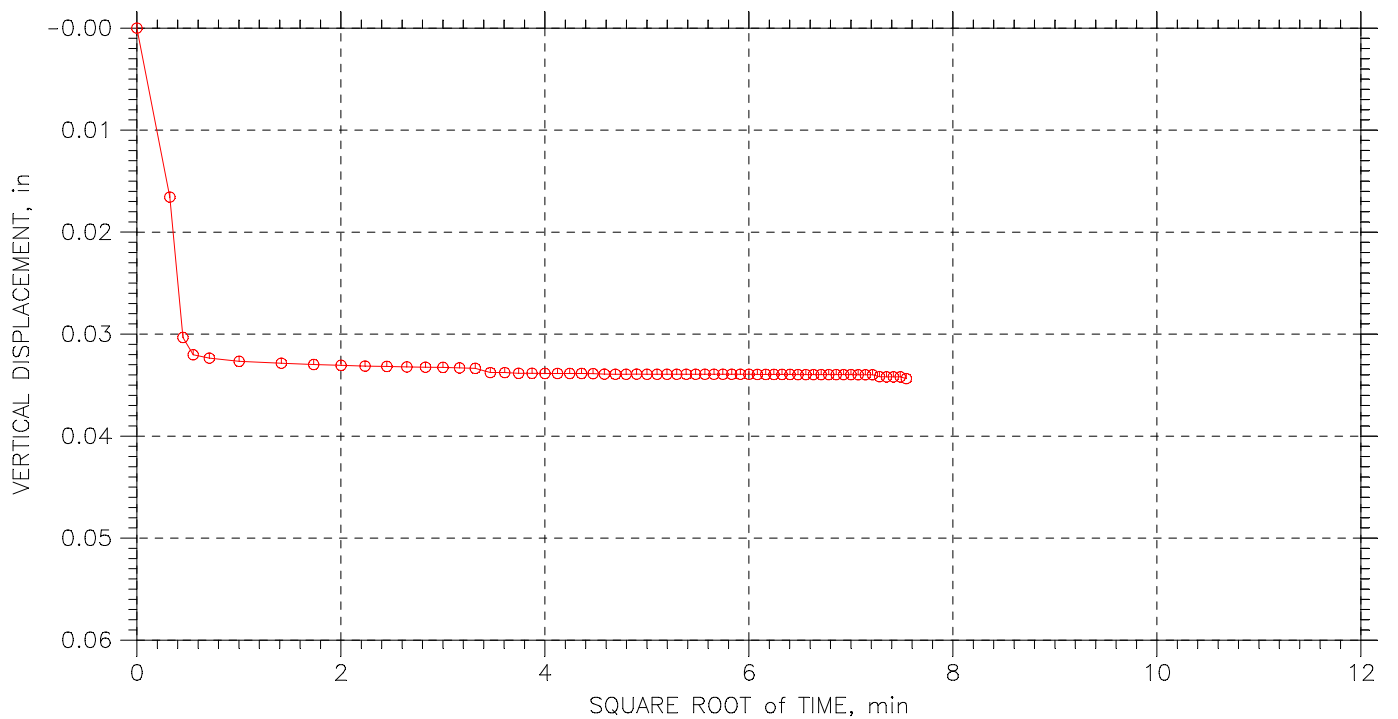
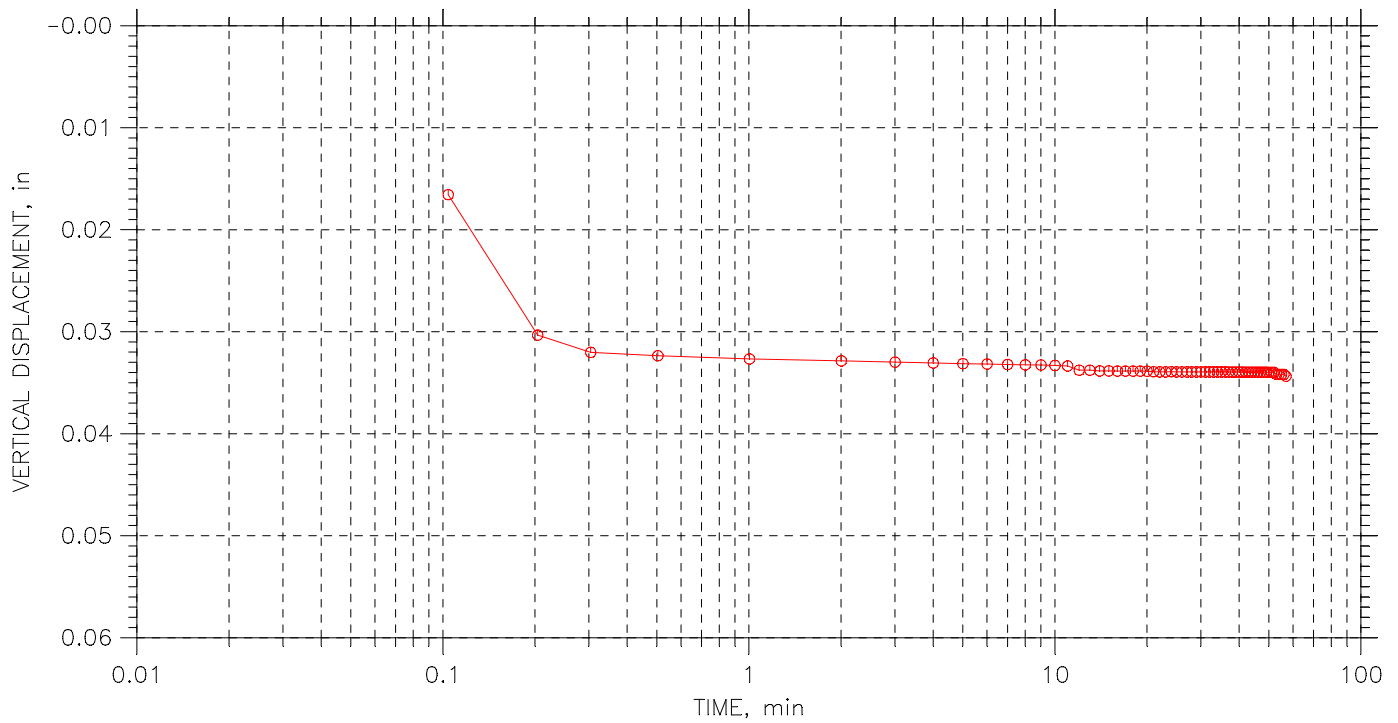
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-1A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/30/07	Depth: 23.0'
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

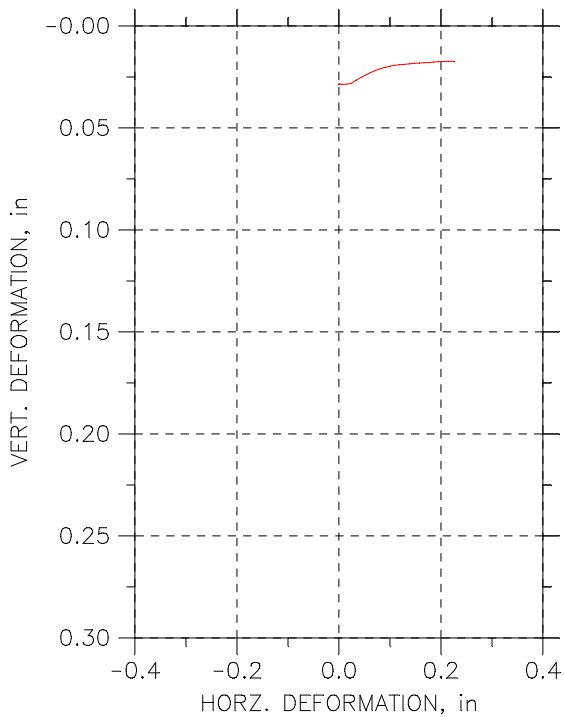
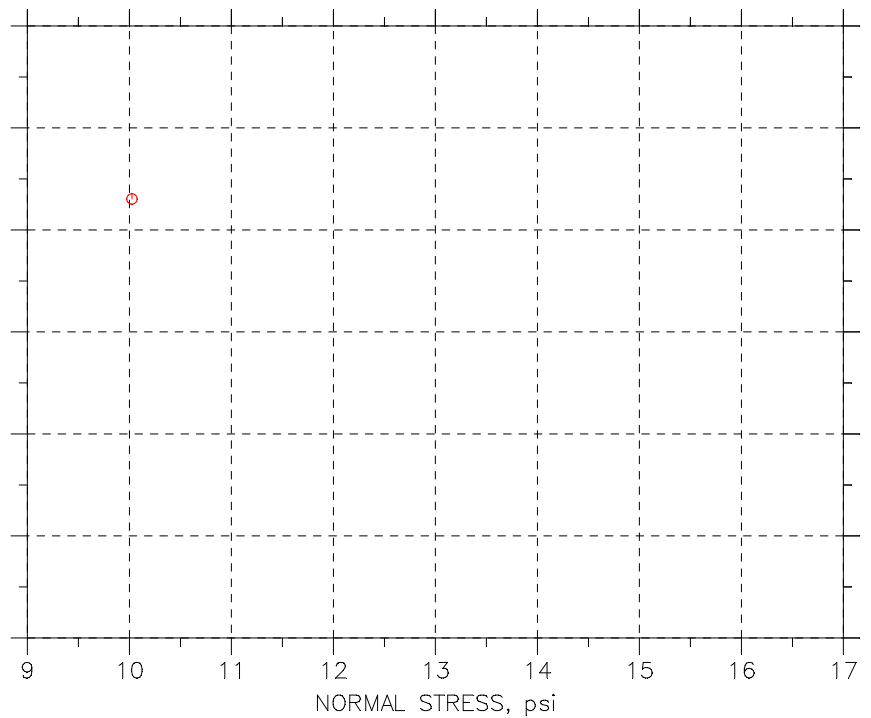
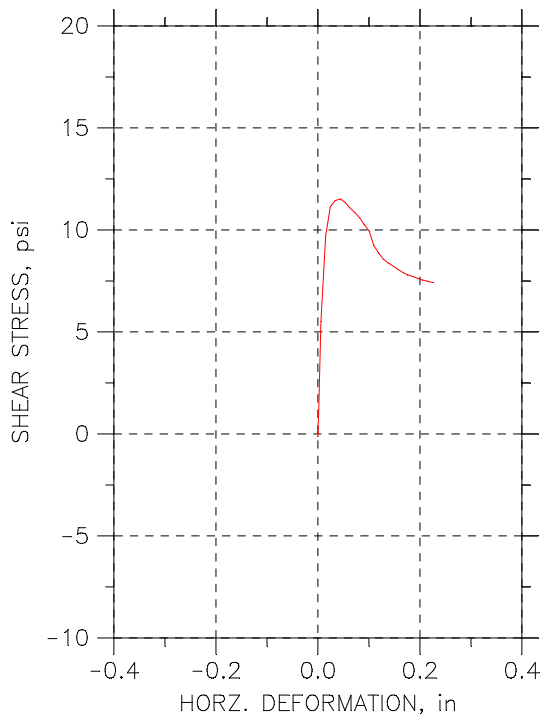
Step: 1 of 1

Stress: 33 psi



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-1A	Tested By: sam	Checked By: bert
Sample No.: P-1	Test Date: 9/30/07	Depth: 23.0'
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist, Soft to Medium Stiff Reddish Brown Silty CLAY with medium to fine Sand lenses. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

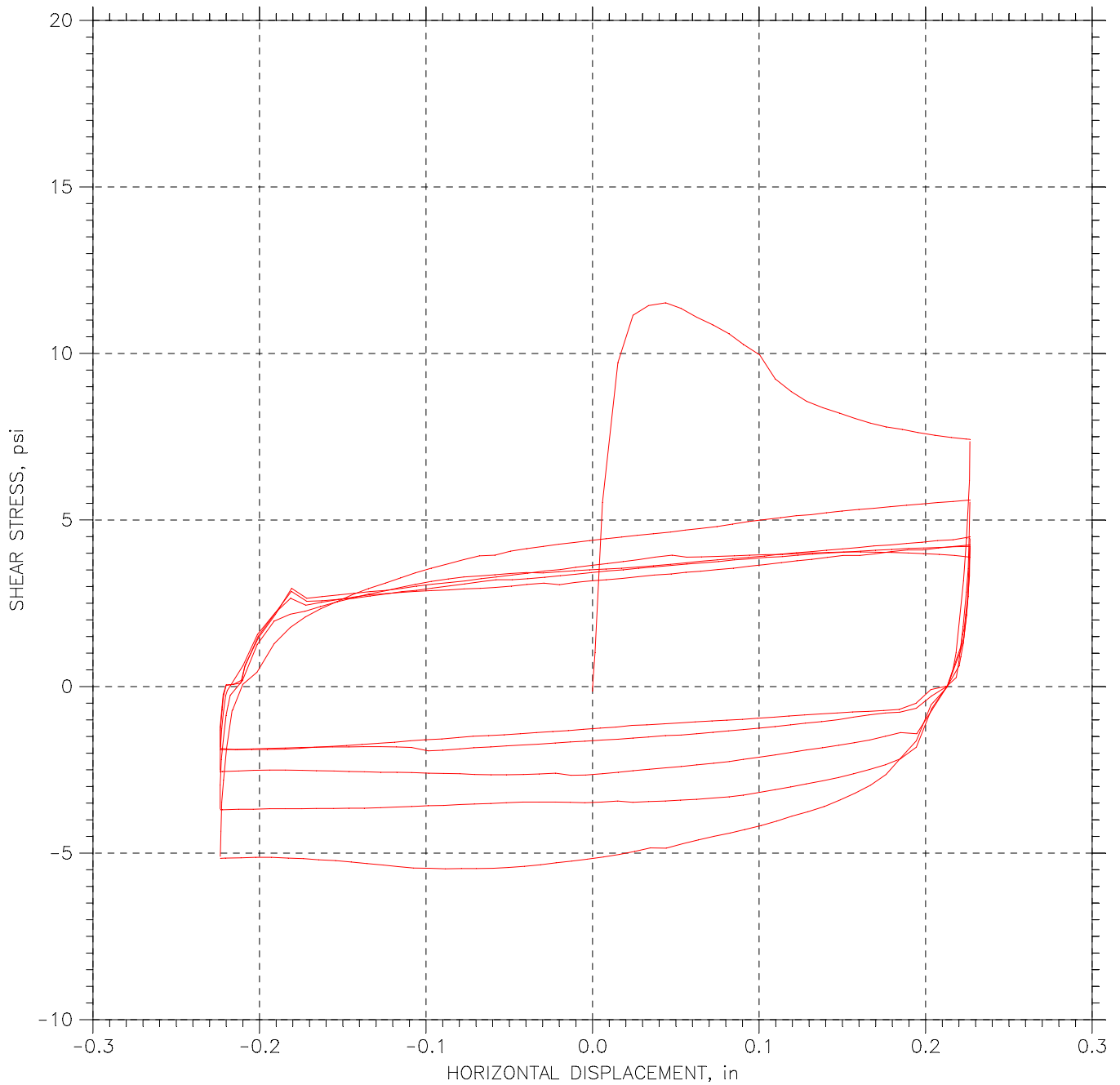
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	1			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	35.05		
	Dry Density, pcf	96.61		
	Saturation, %	127.10		
	Void Ratio	0.74465		
Consol. Height, in		0.97805		
Consol. Void Ratio		0.70636		
Final	Water Content, %	27.46		
	Dry Density, pcf	118.9		
	Saturation, %	177.78		
	Void Ratio	0.41713		
Normal Stress, psi		10.025		
Max. Shear Stress, psi		11.519		
Ult. Shear Stress, psi		7.4198		
Time to Failure, min		5.0036		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		18		
Plasticity Index		32		
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)				
Remarks: Residual Direct Shear.				

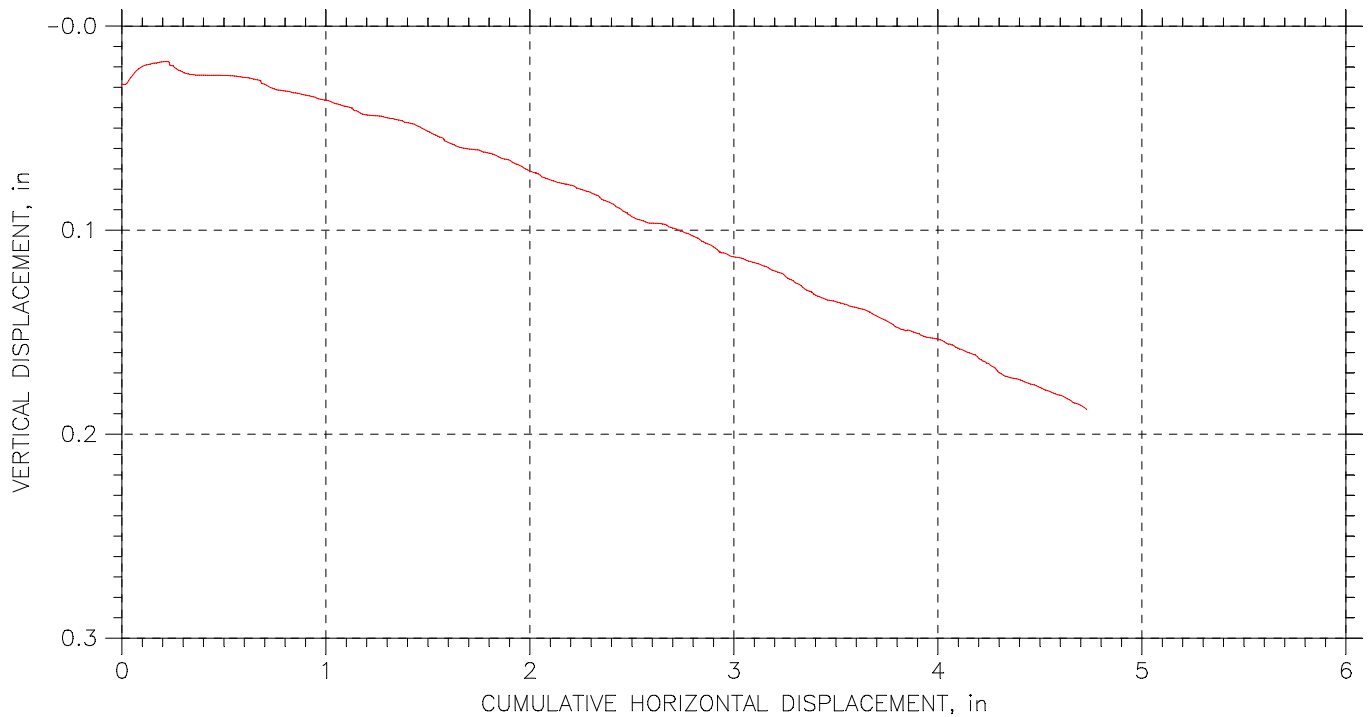
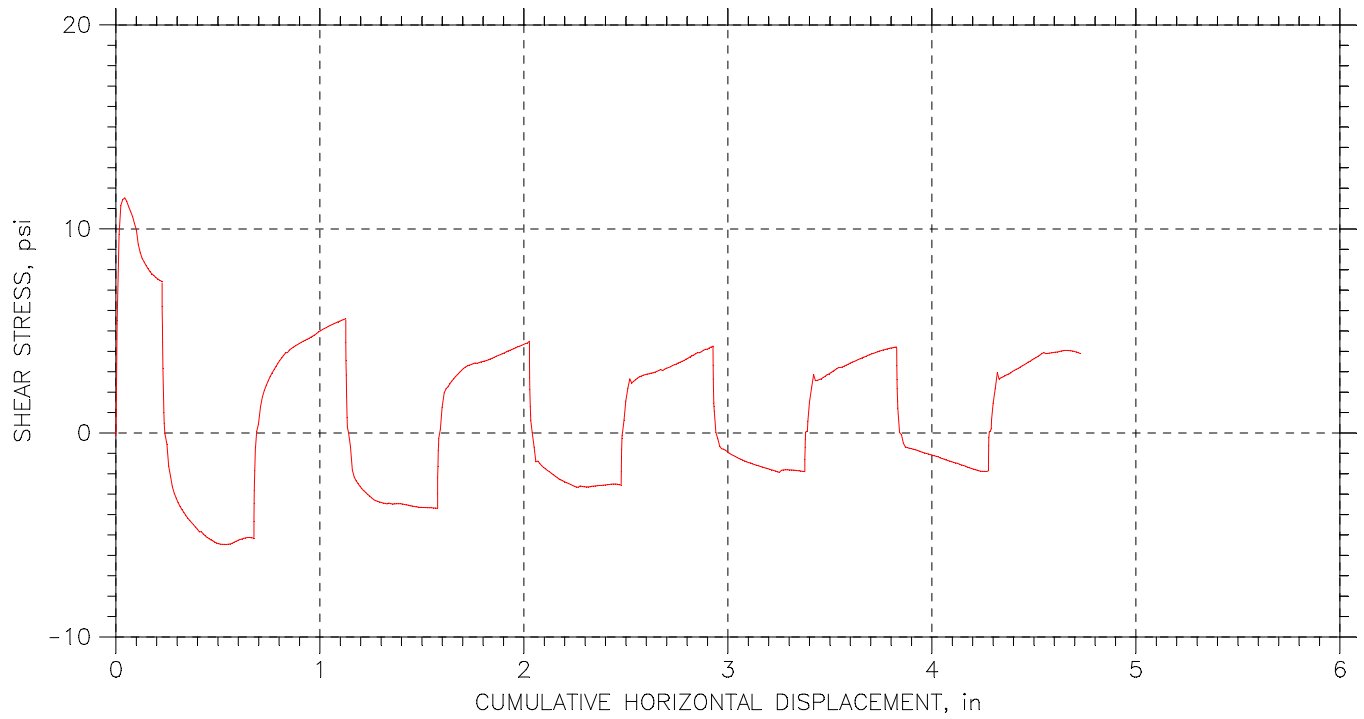
Project: Purple Line
Location: Riverdale, MD
Project No.: 14961
Boring No.: RD-2A
Sample Type: Pitcher
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)
Remarks: Residual Direct Shear.

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/17/07	Depth: 34.3
Test No.: 1	Sample Type: Pitcher	Elevation:
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



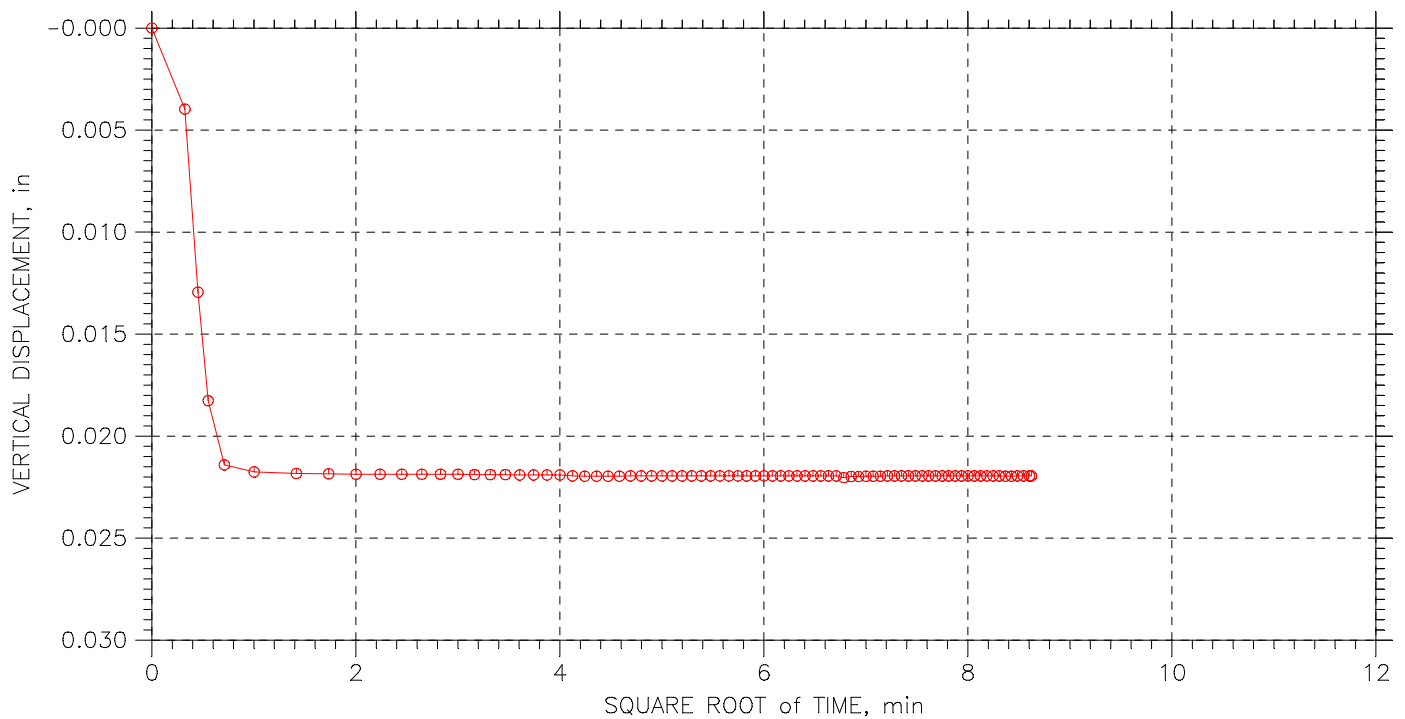
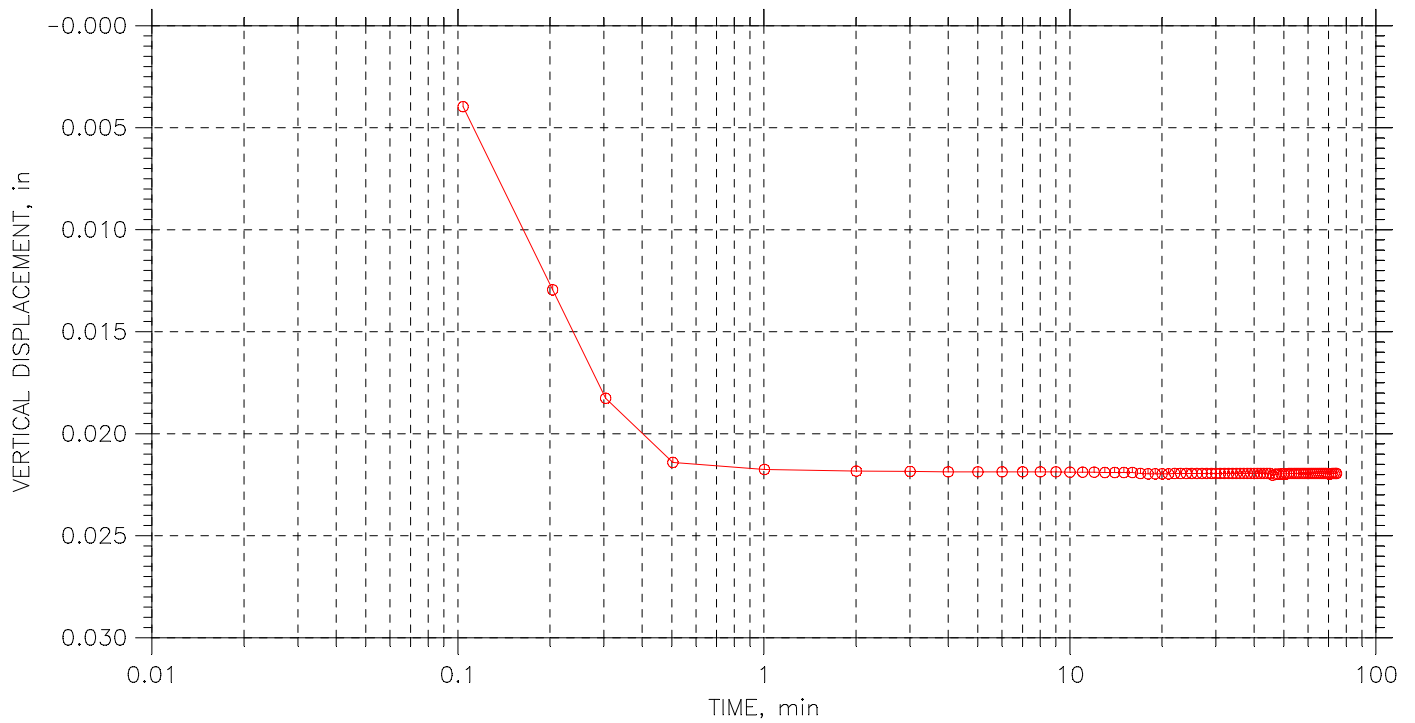
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/17/07	Depth: 34.3
Test No.: 1	Sample Type: Pitcher	Elevation:
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear.		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 1

Stress: 10 psi



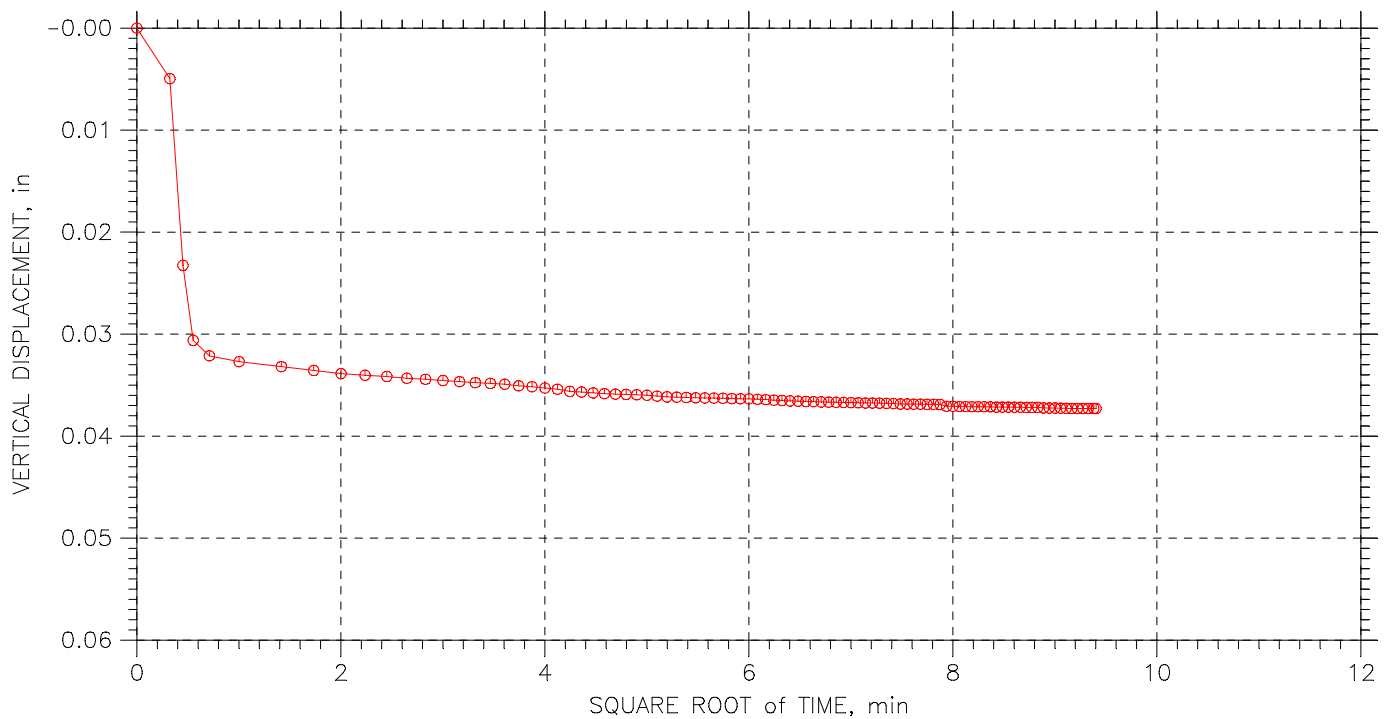
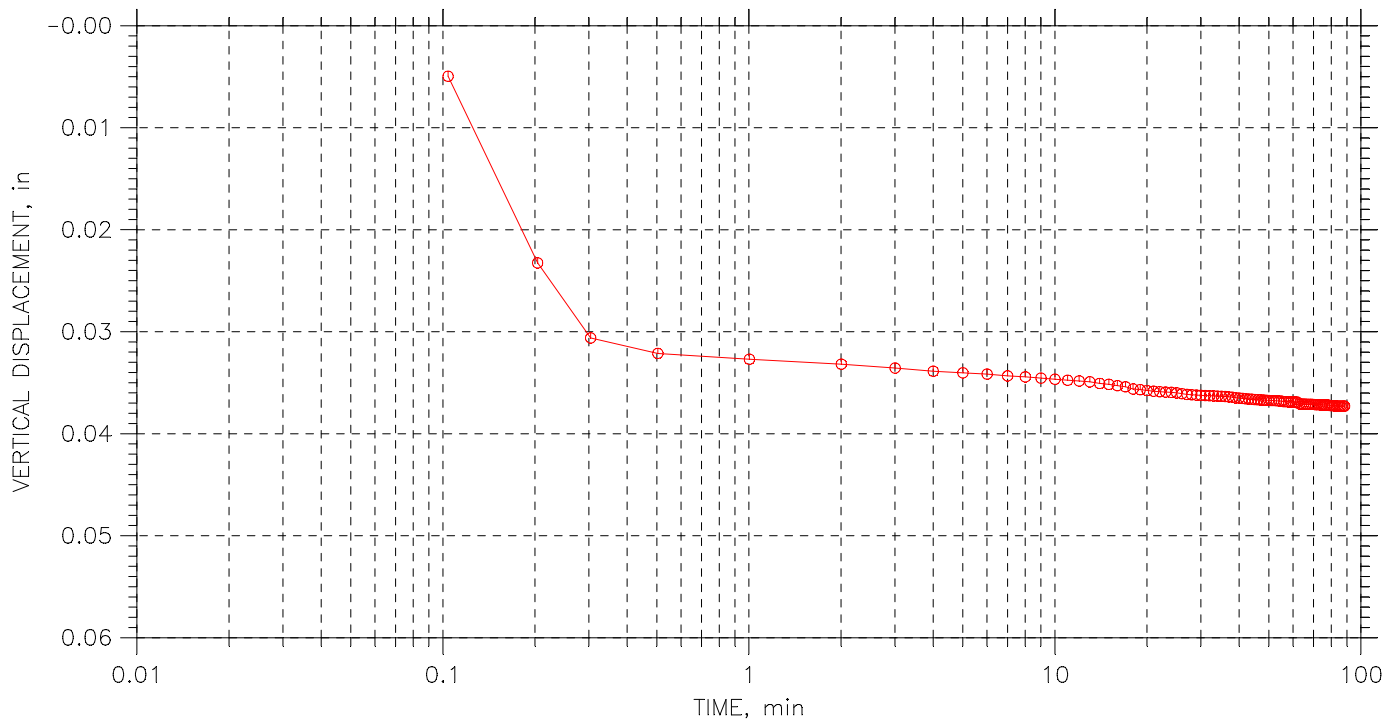
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/17/07	Depth: 34.3
Test No.: 1	Sample Type: Pitcher	Elevation:
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 1

Stress: 20 psi



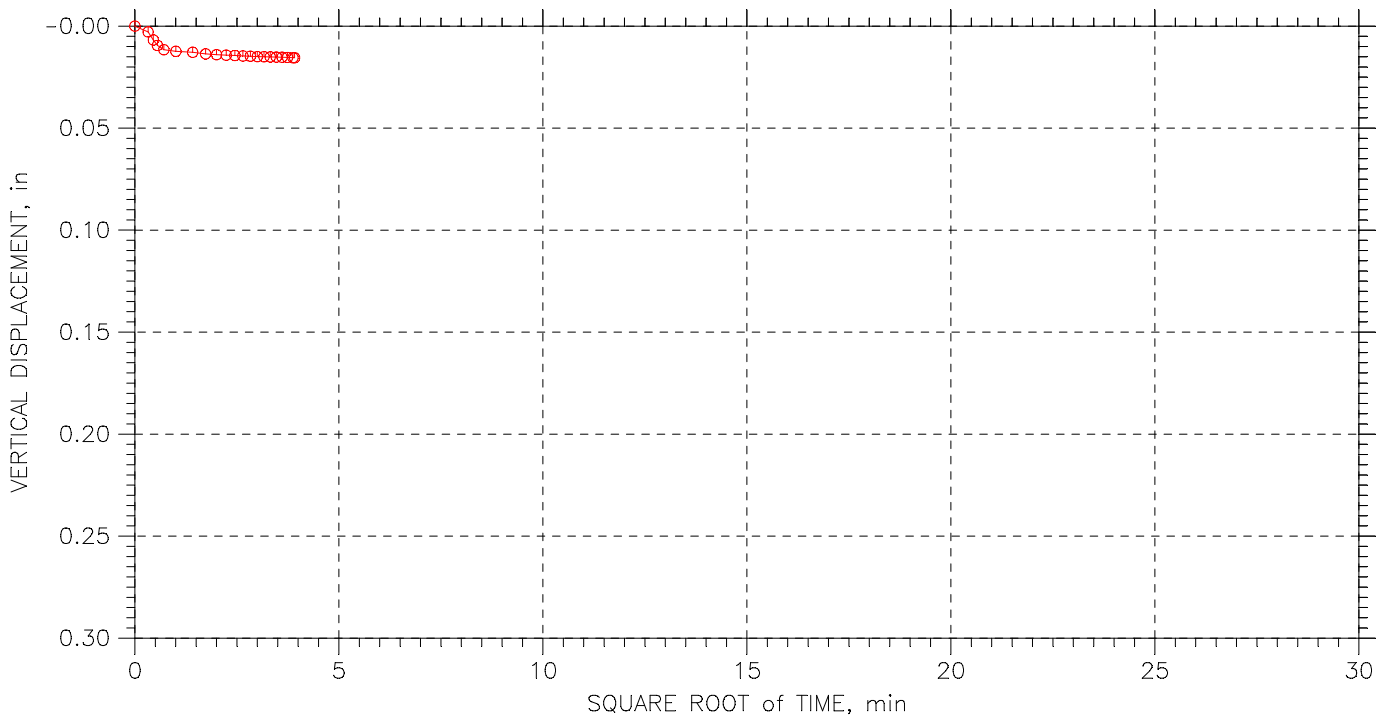
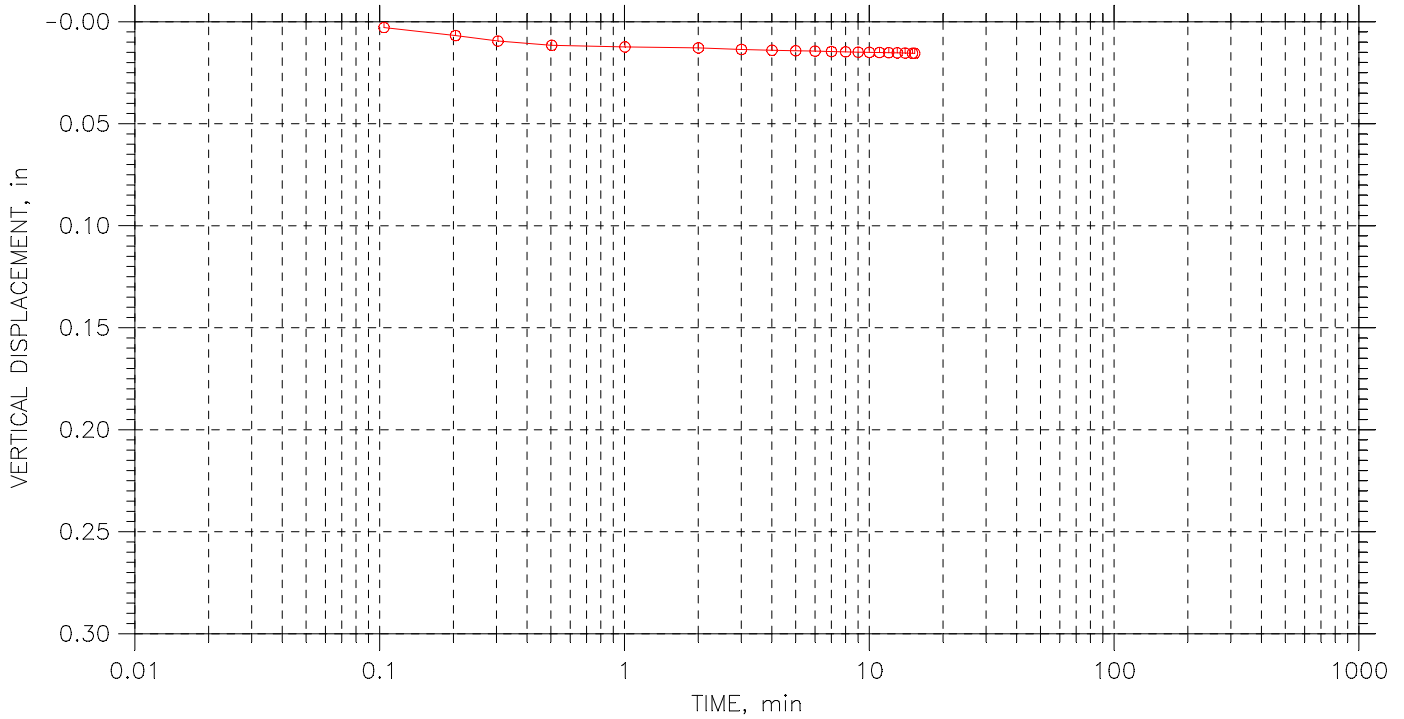
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.5
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 1 of 15

Stress: 2 psi



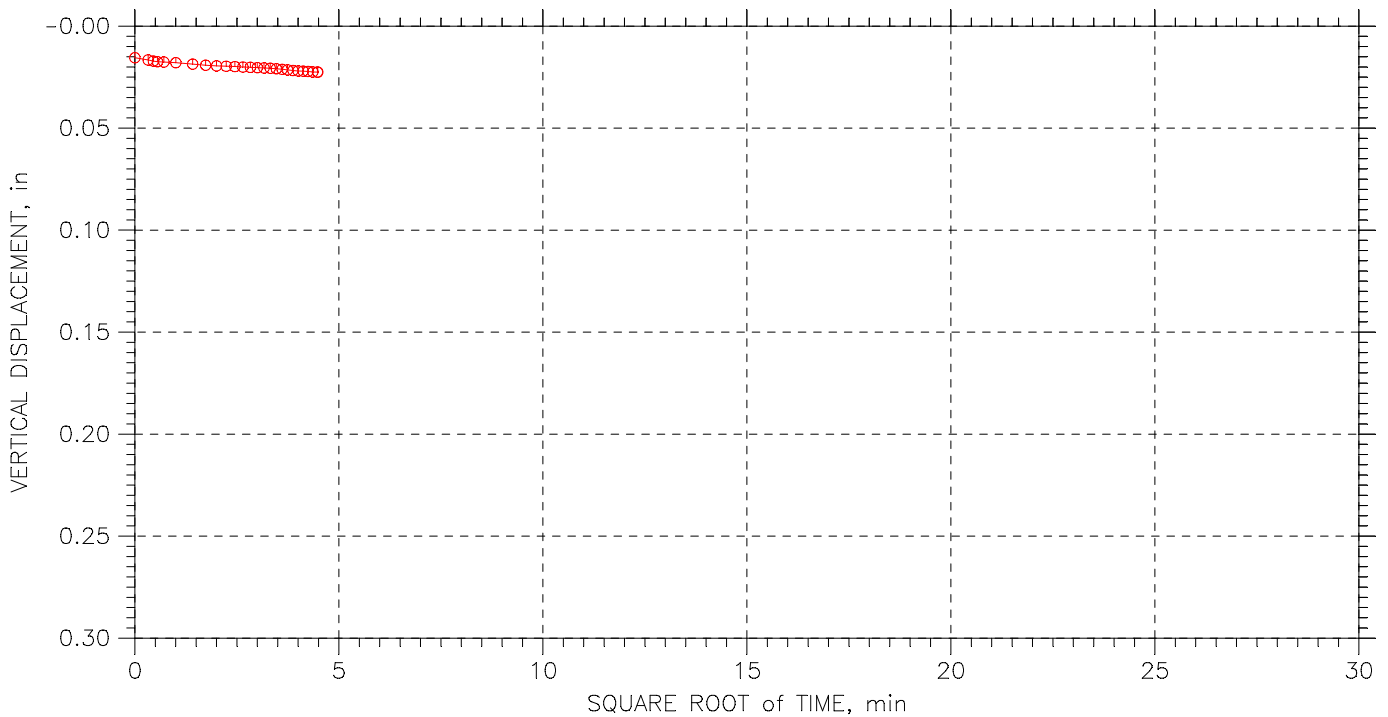
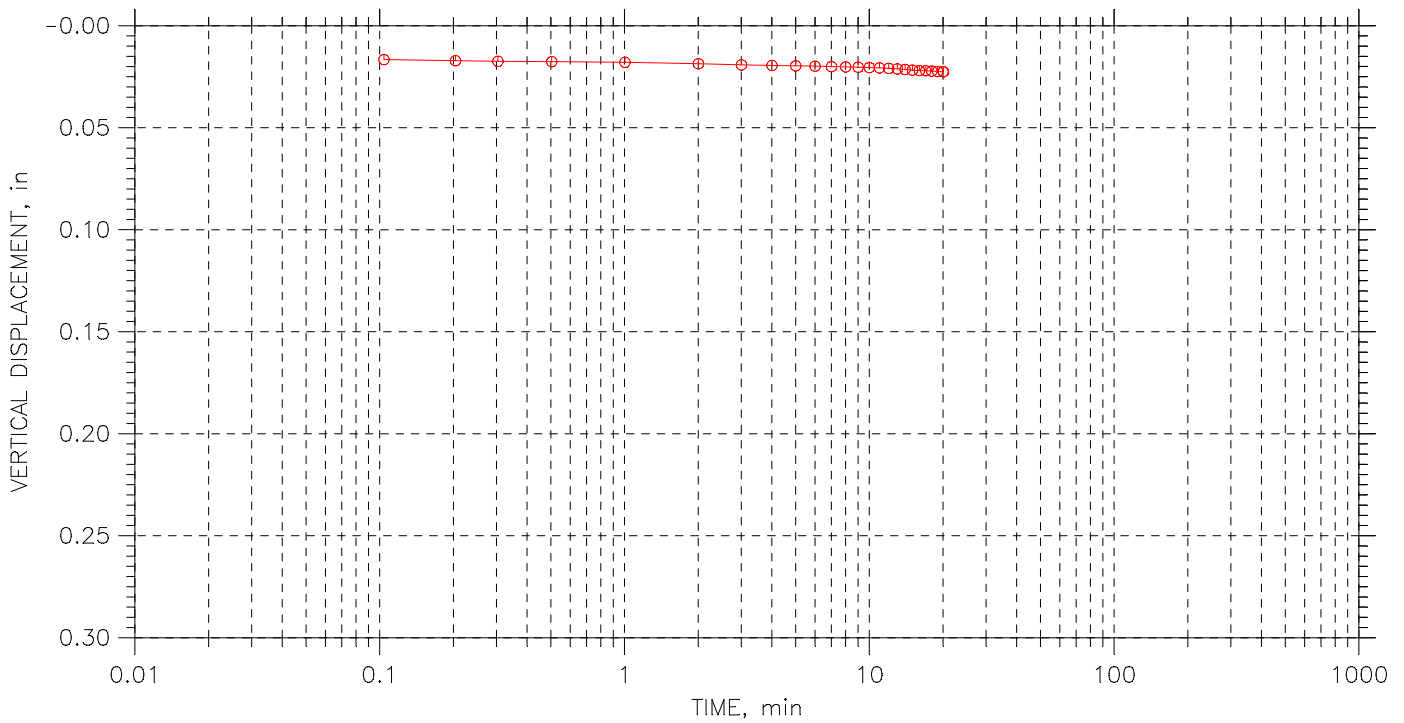
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 2 of 15

Stress: 3 psi



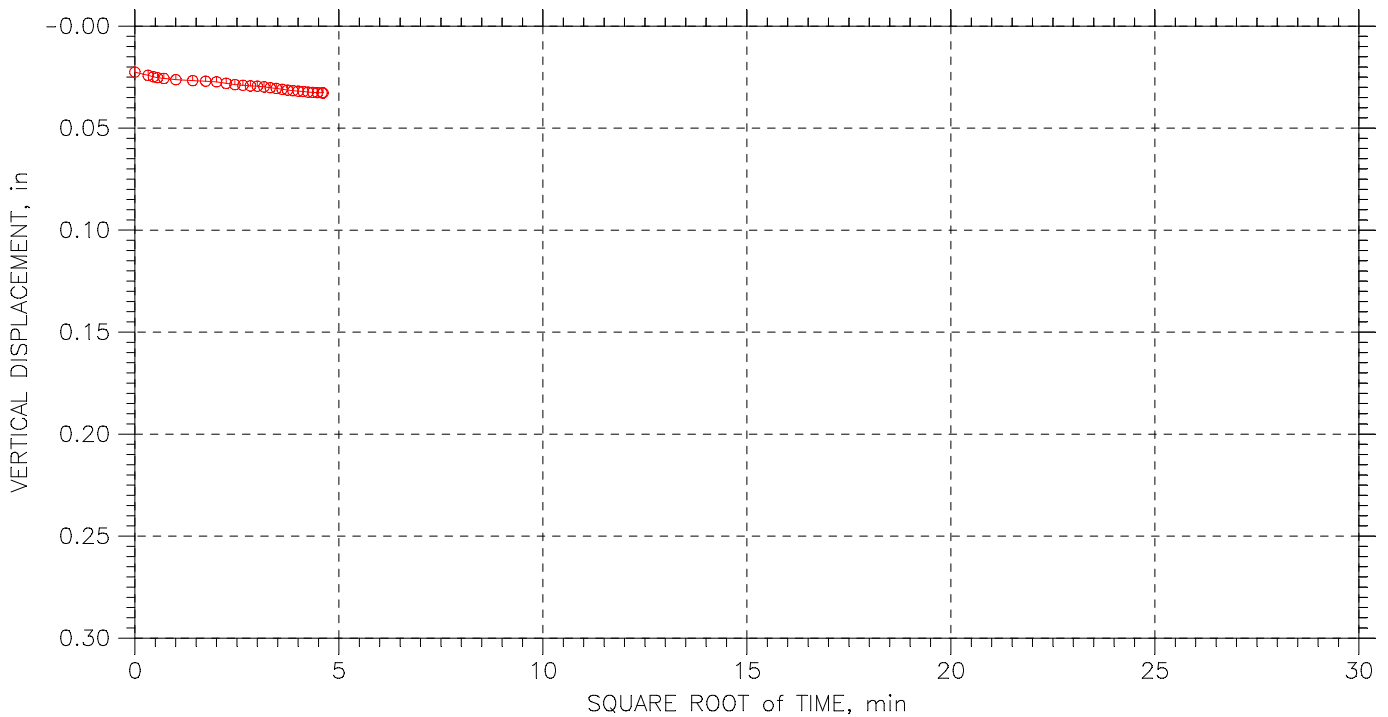
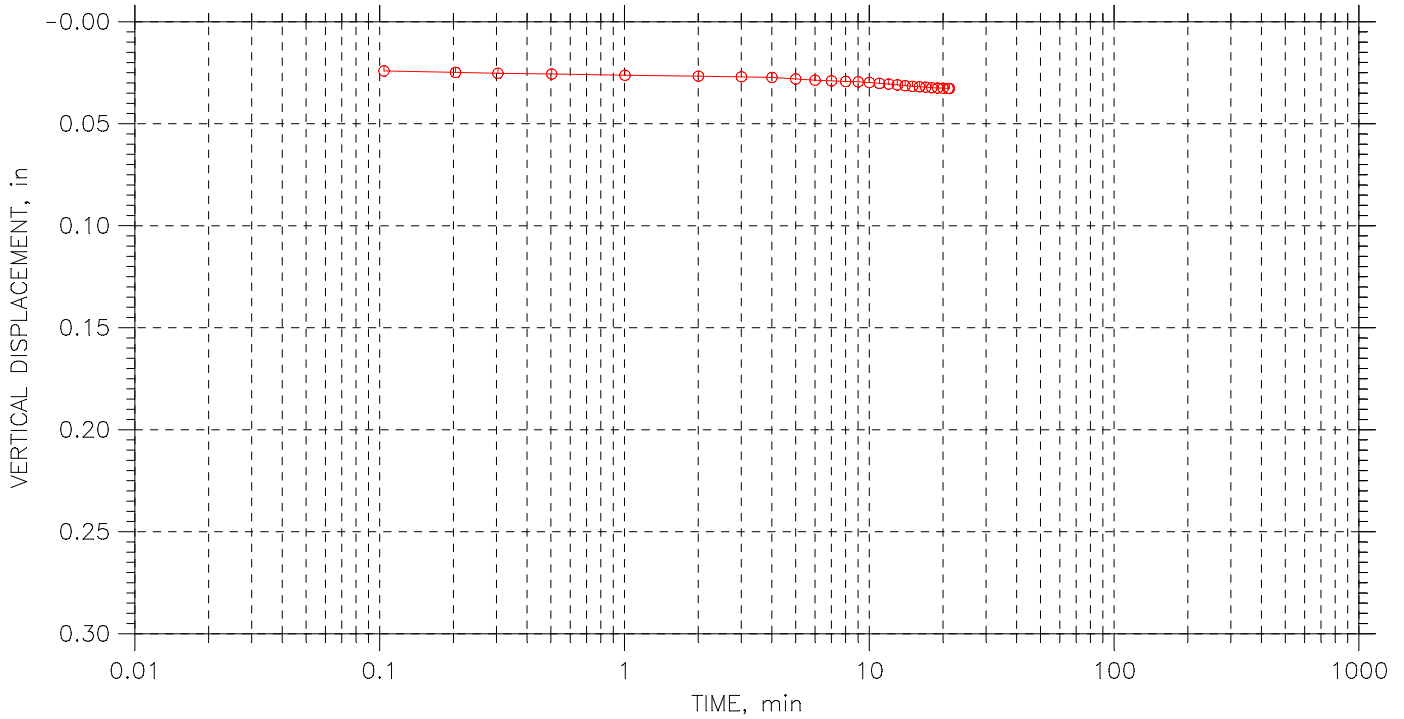
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 3 of 15

Stress: 5 psi



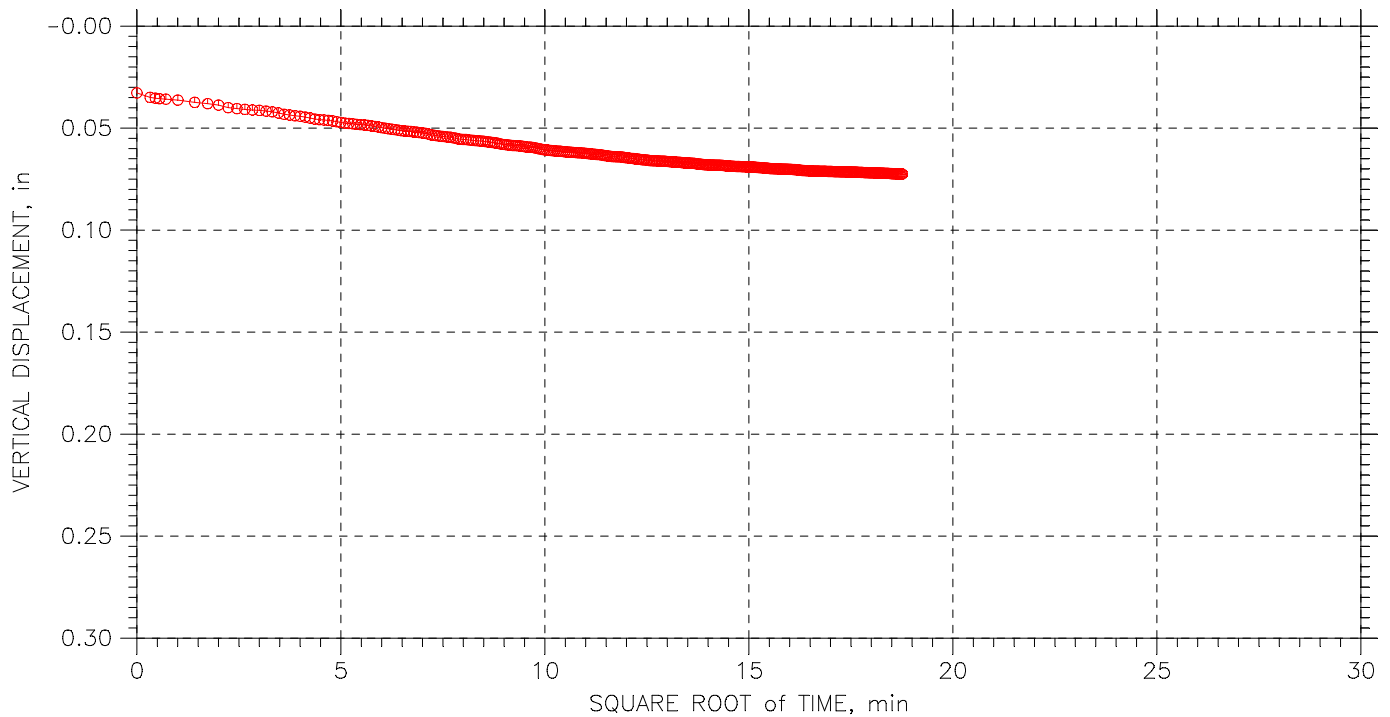
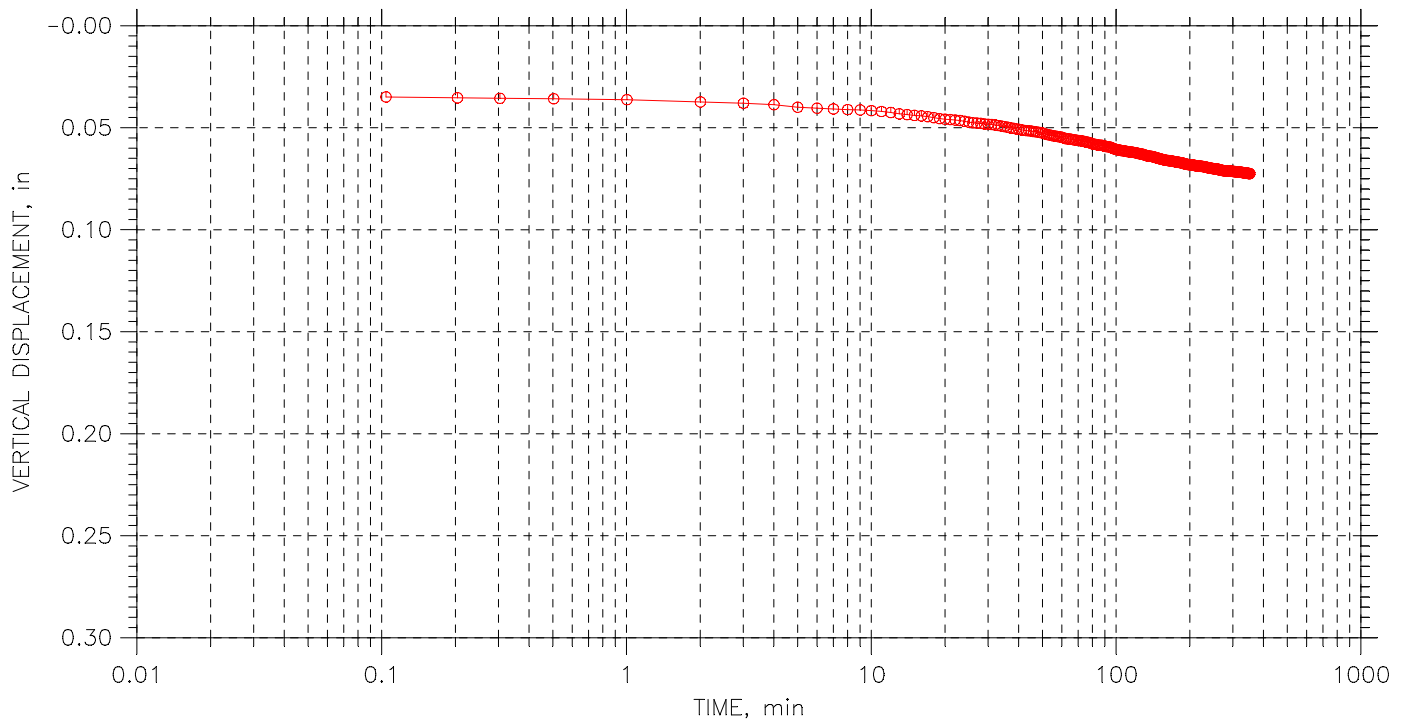
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 4 of 15

Stress: 8 psi



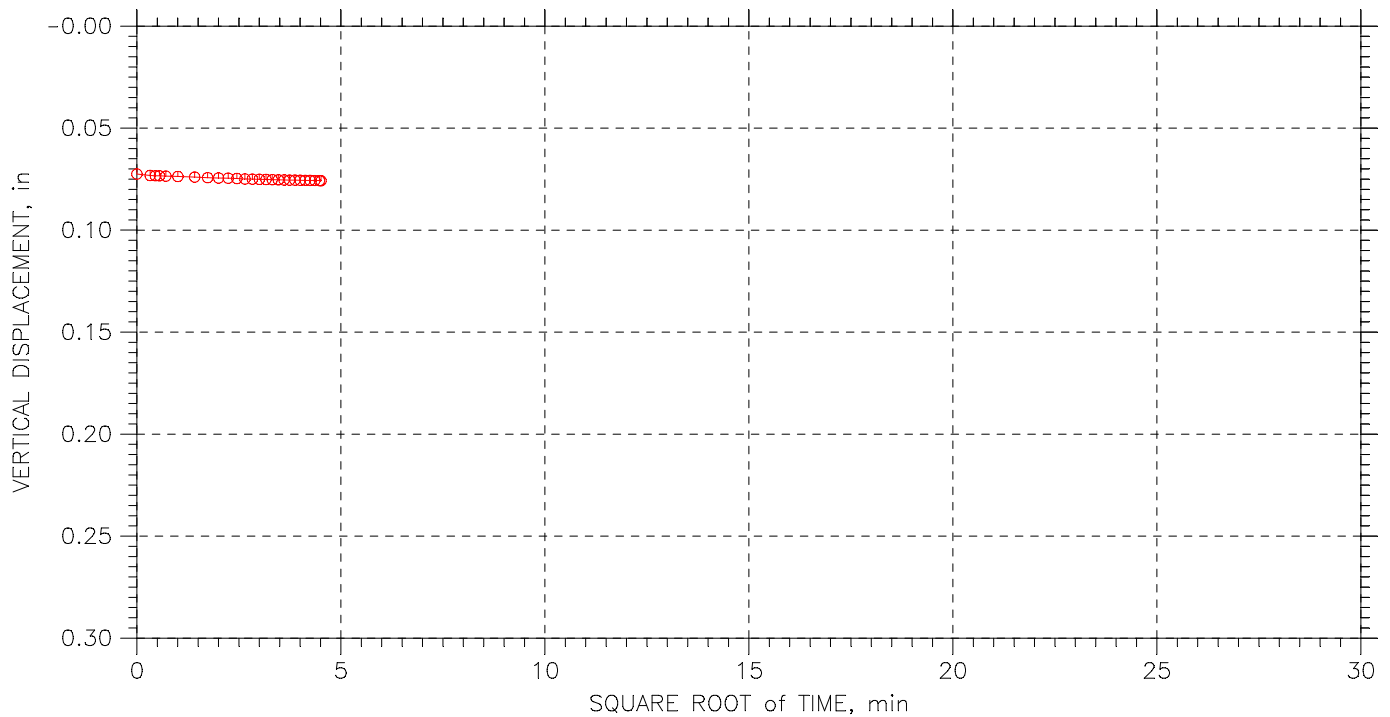
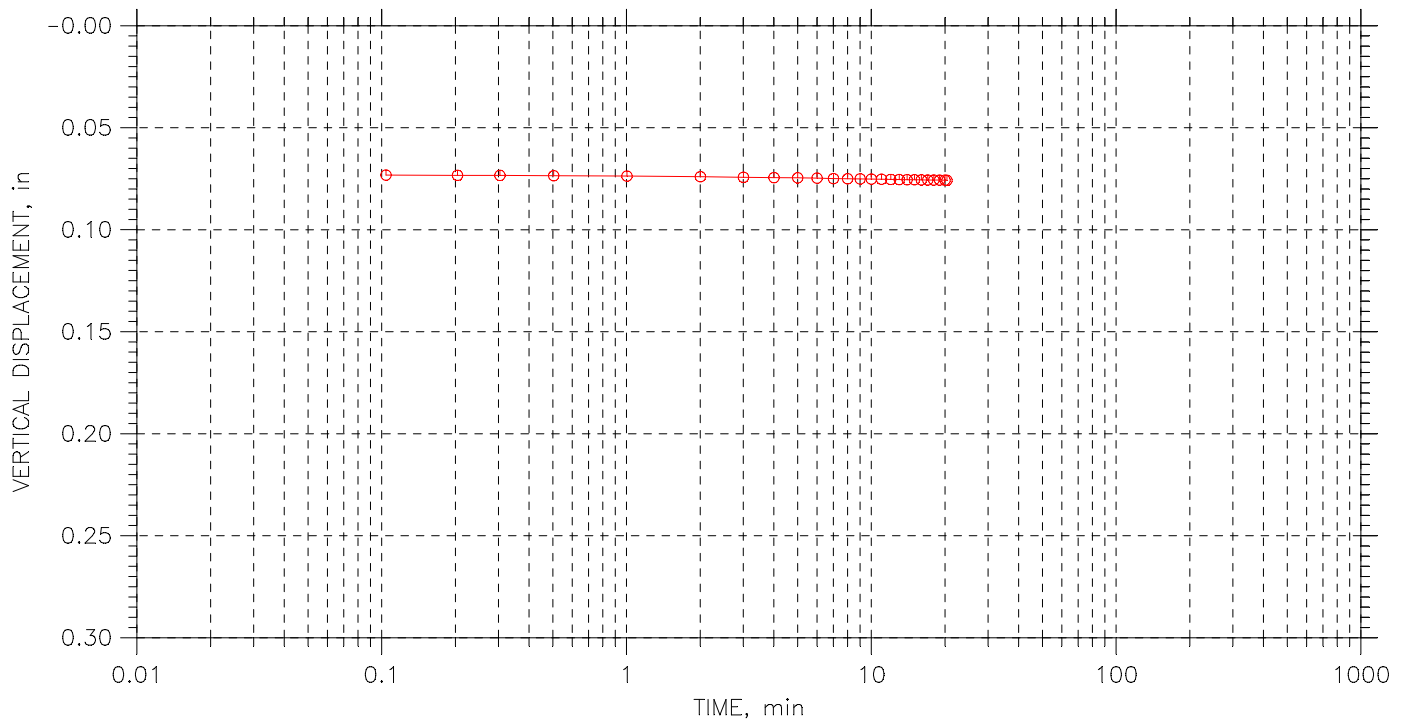
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 5 of 15

Stress: 10 psi



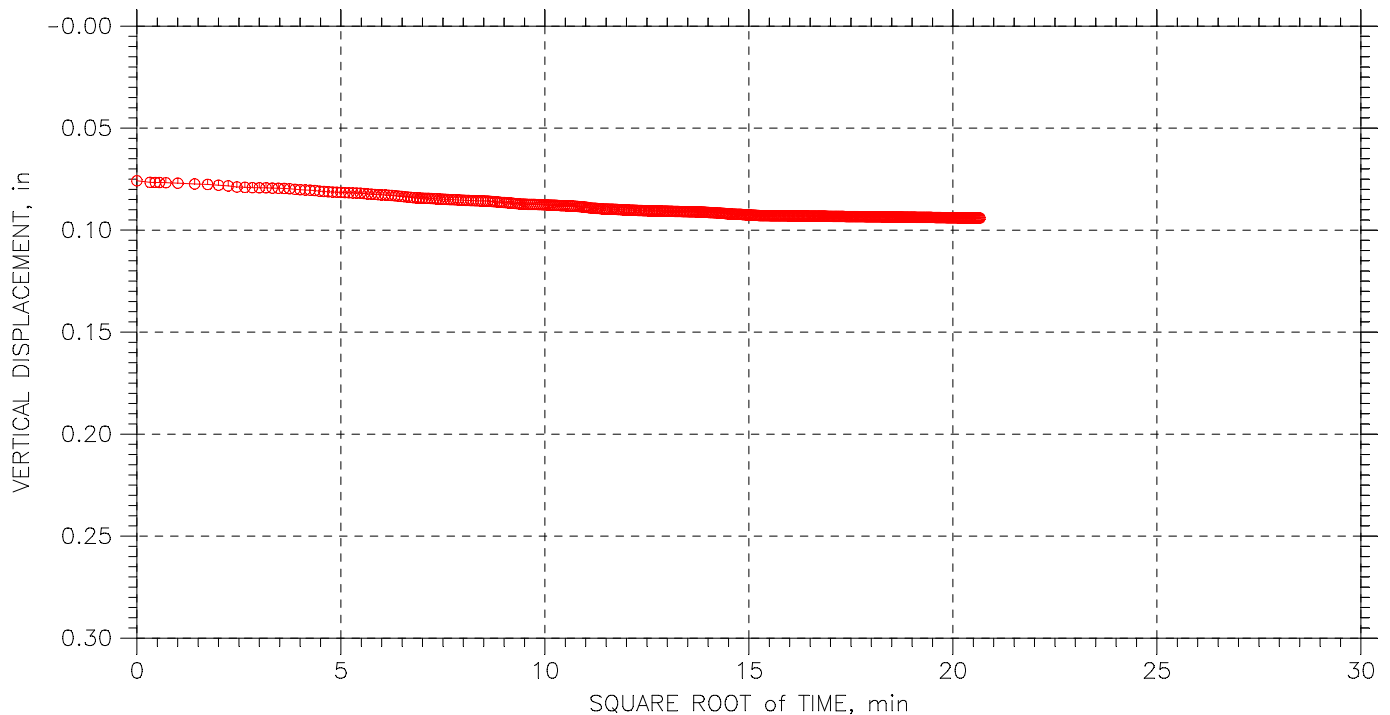
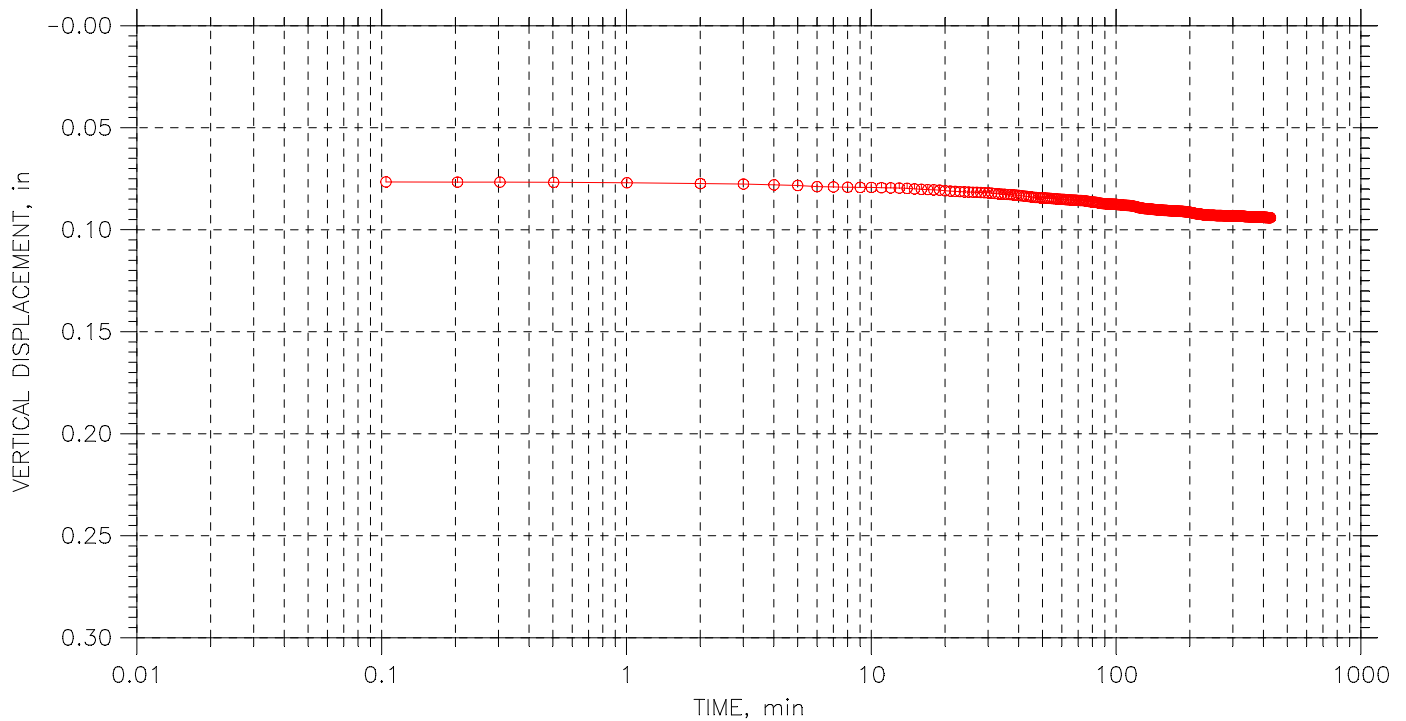
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 6 of 15

Stress: 12 psi



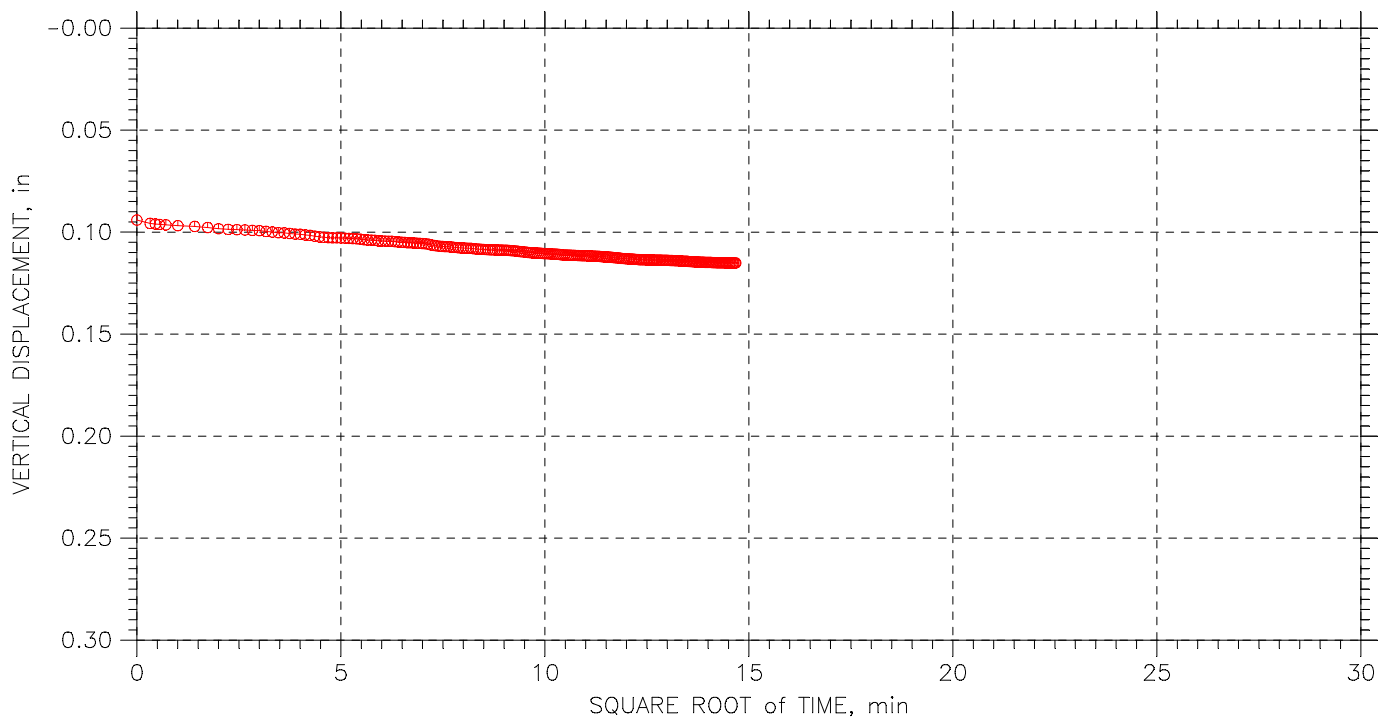
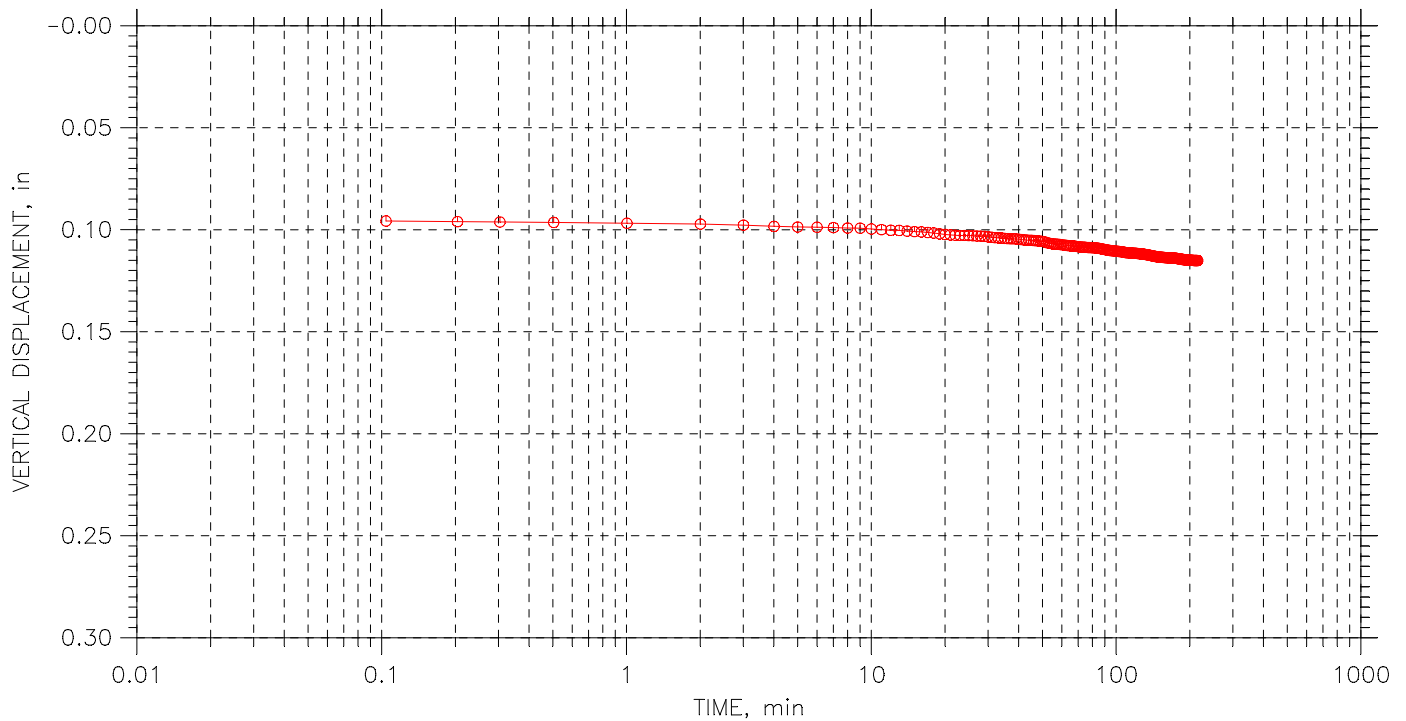
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 7 of 15

Stress: 18 psi



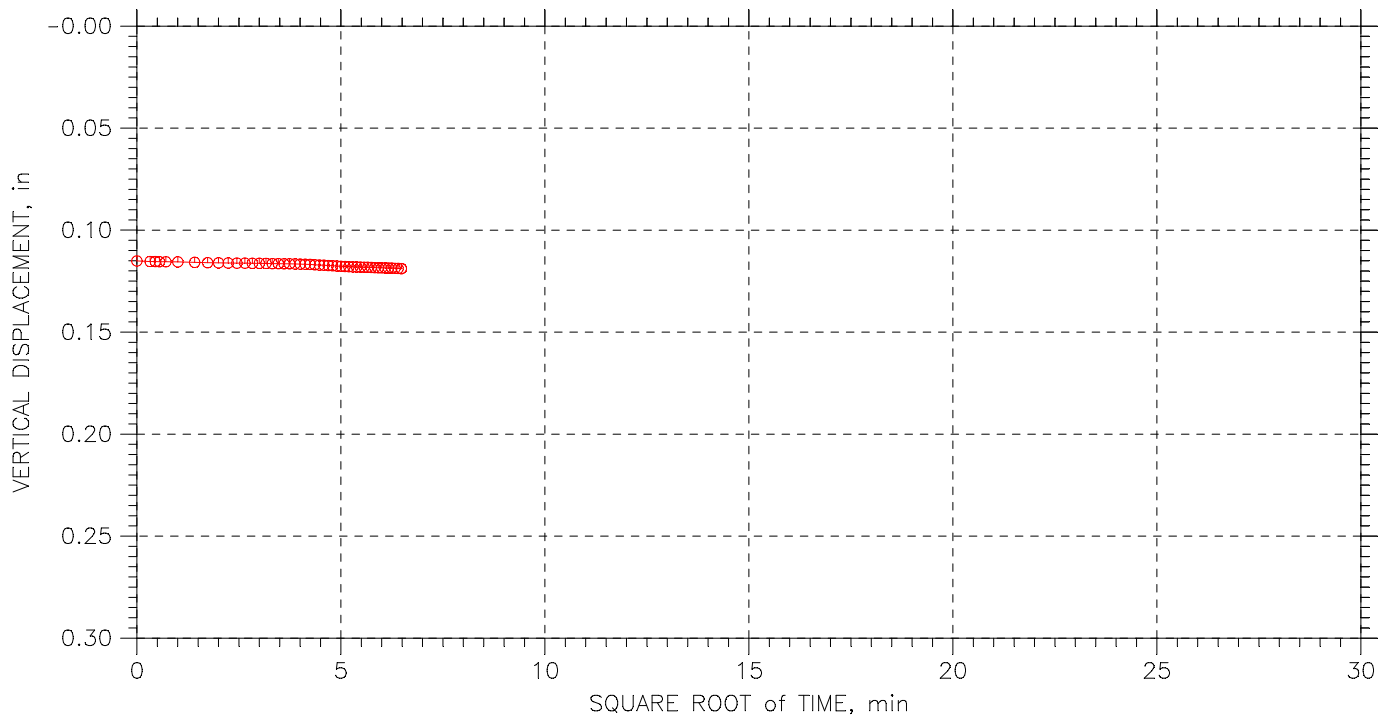
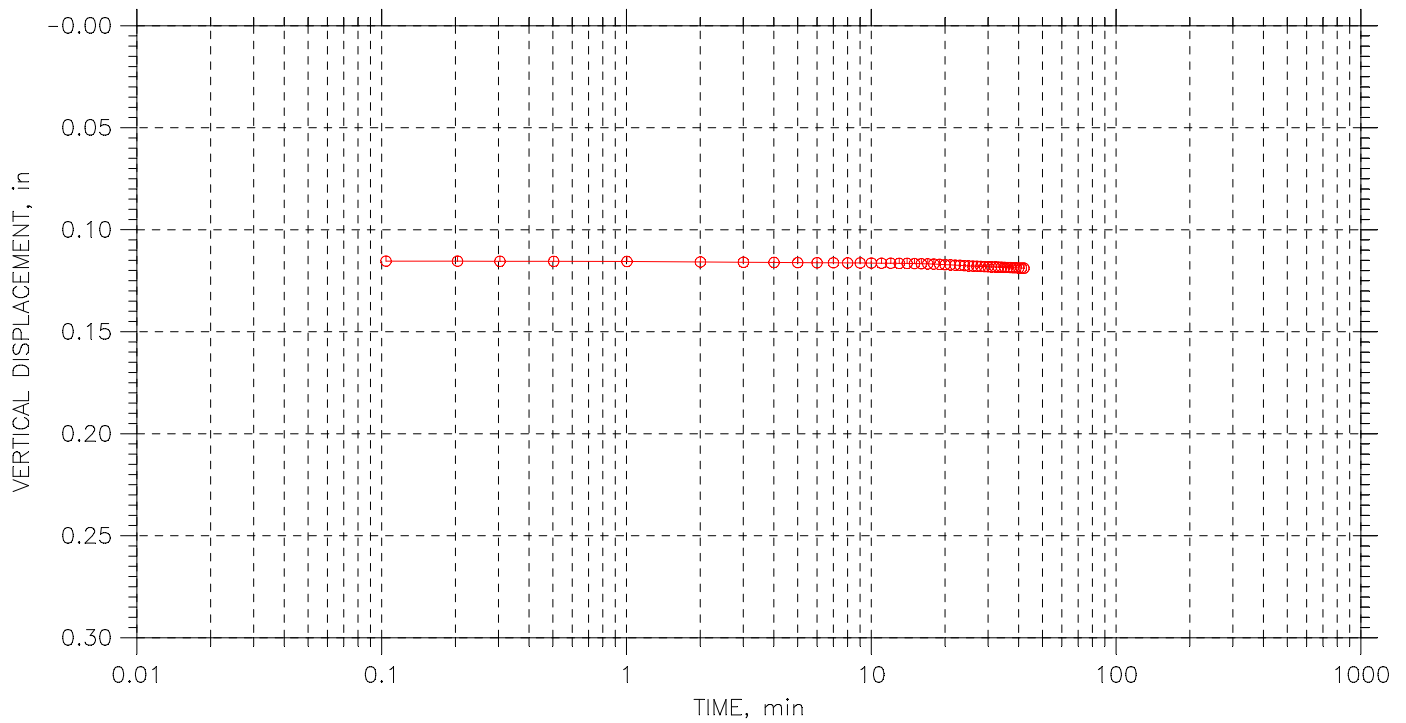
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 8 of 15

Stress: 20 psi



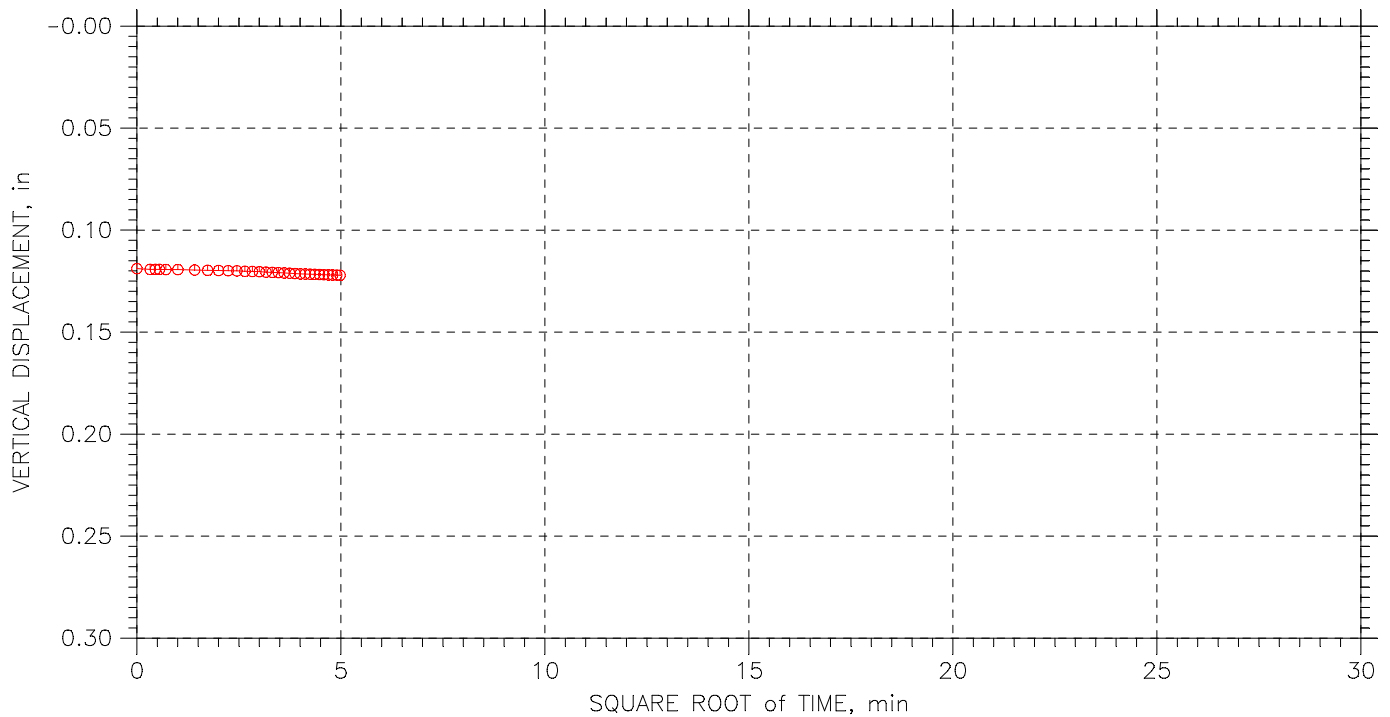
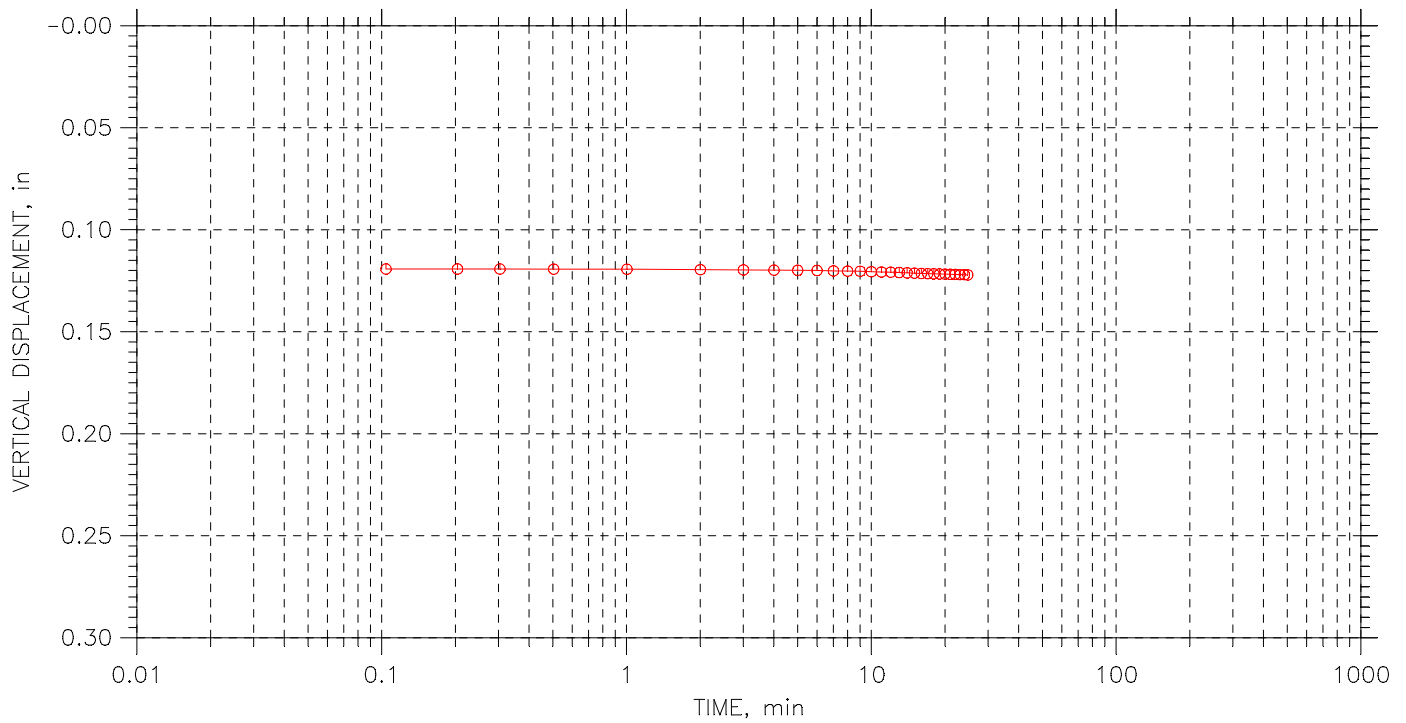
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 9 of 15

Stress: 22 psi



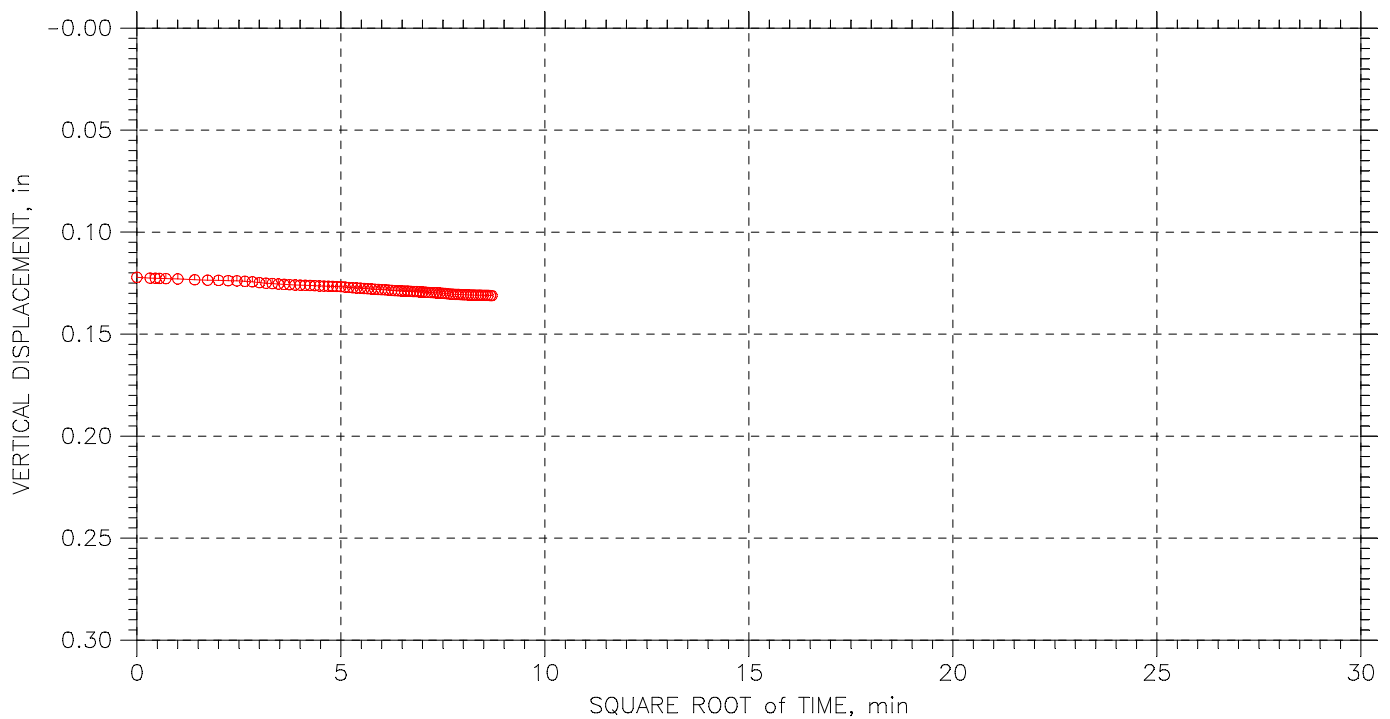
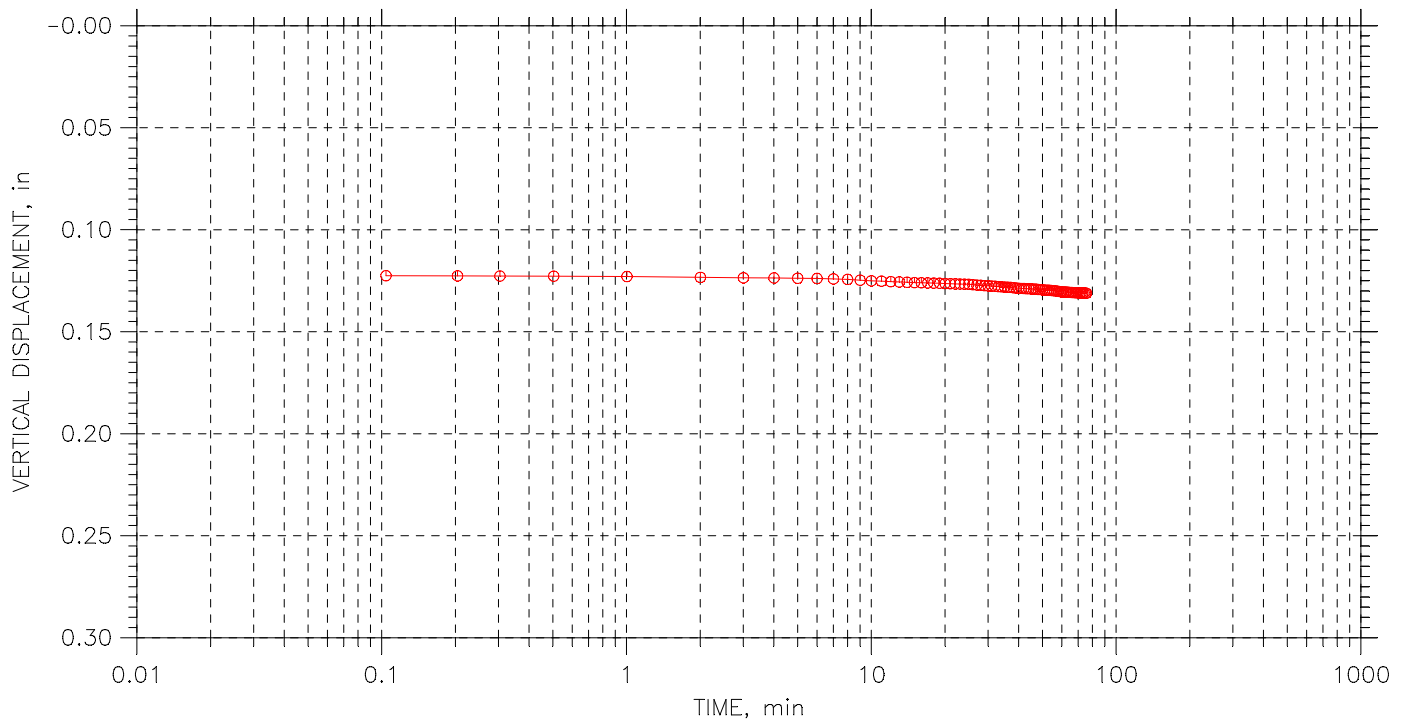
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 10 of 15

Stress: 25 psi



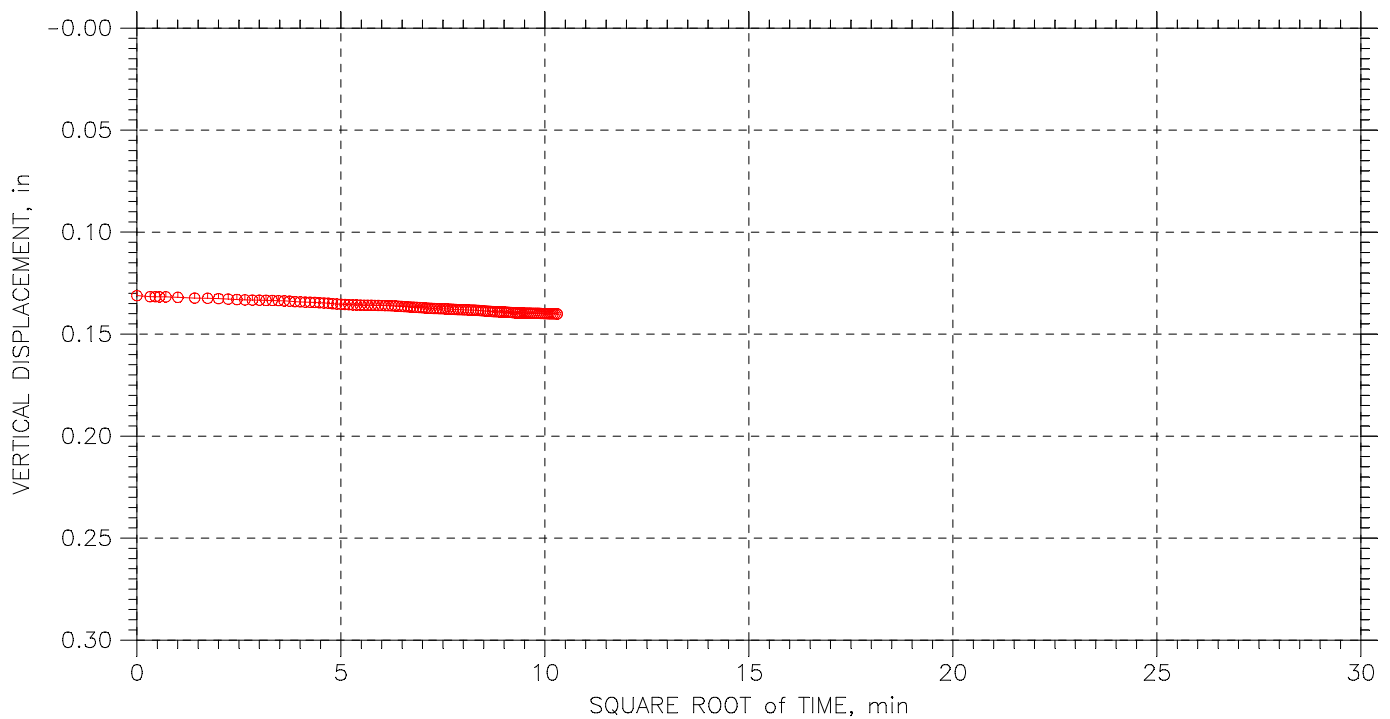
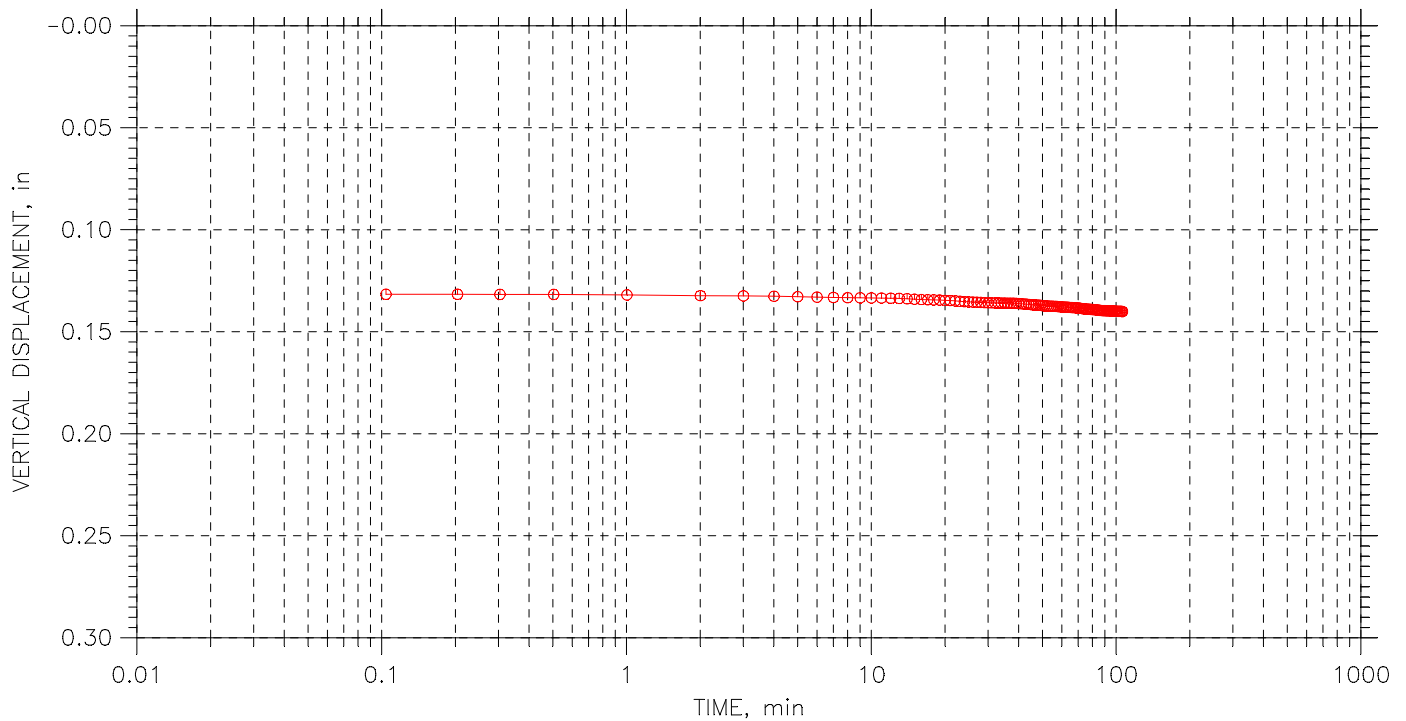
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 11 of 15

Stress: 28 psi



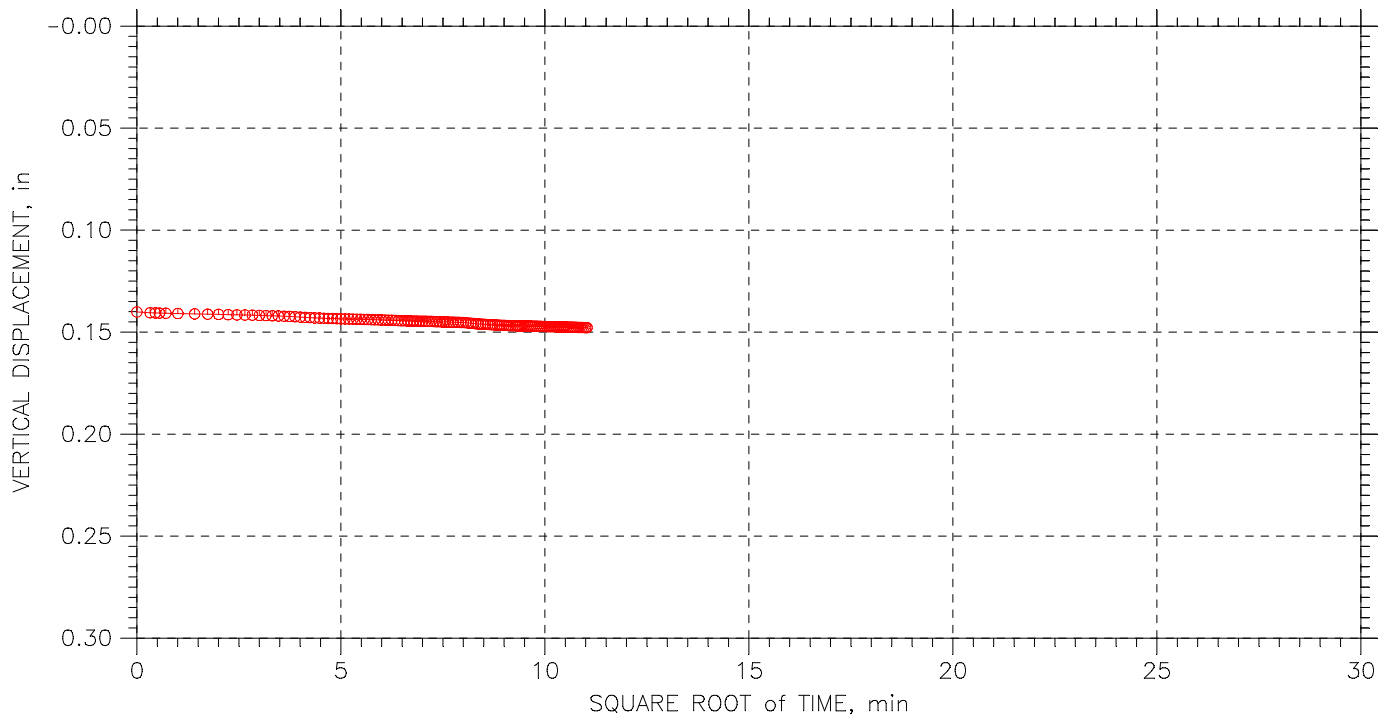
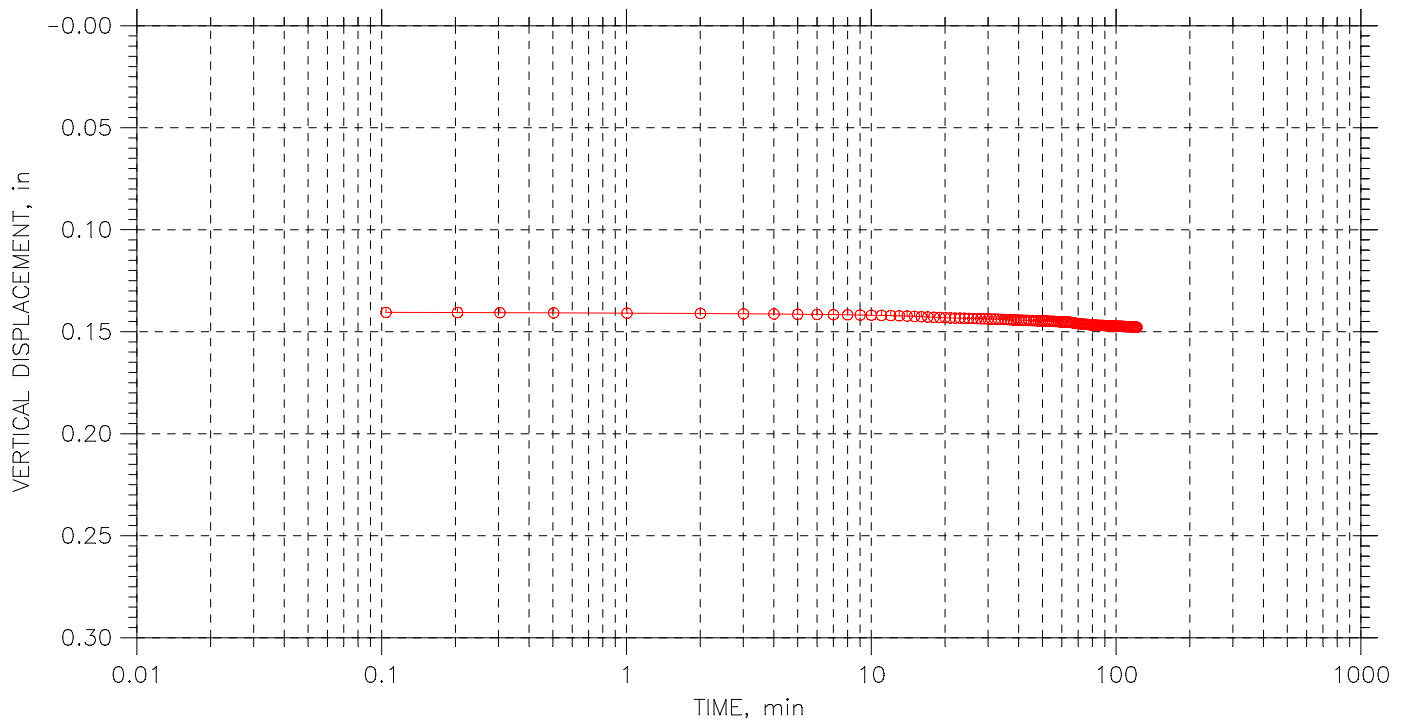
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Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 12 of 15

Stress: 31 psi



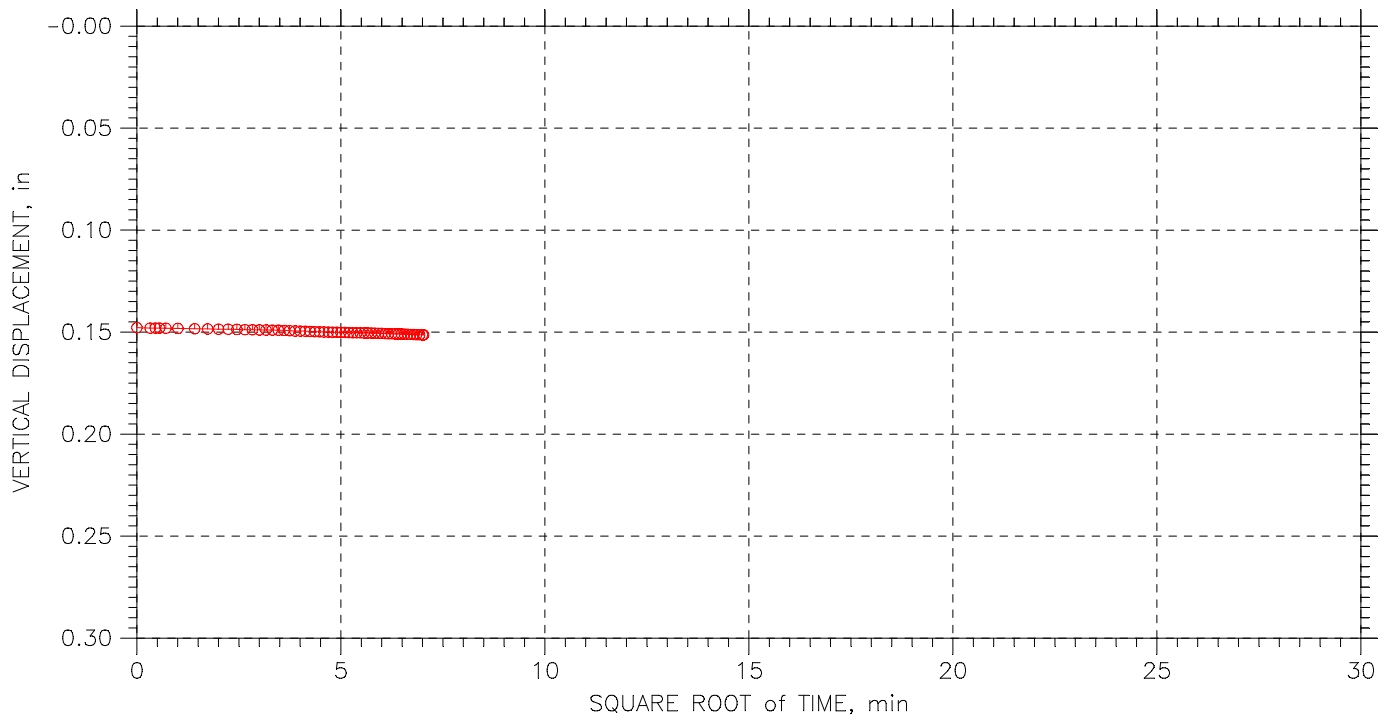
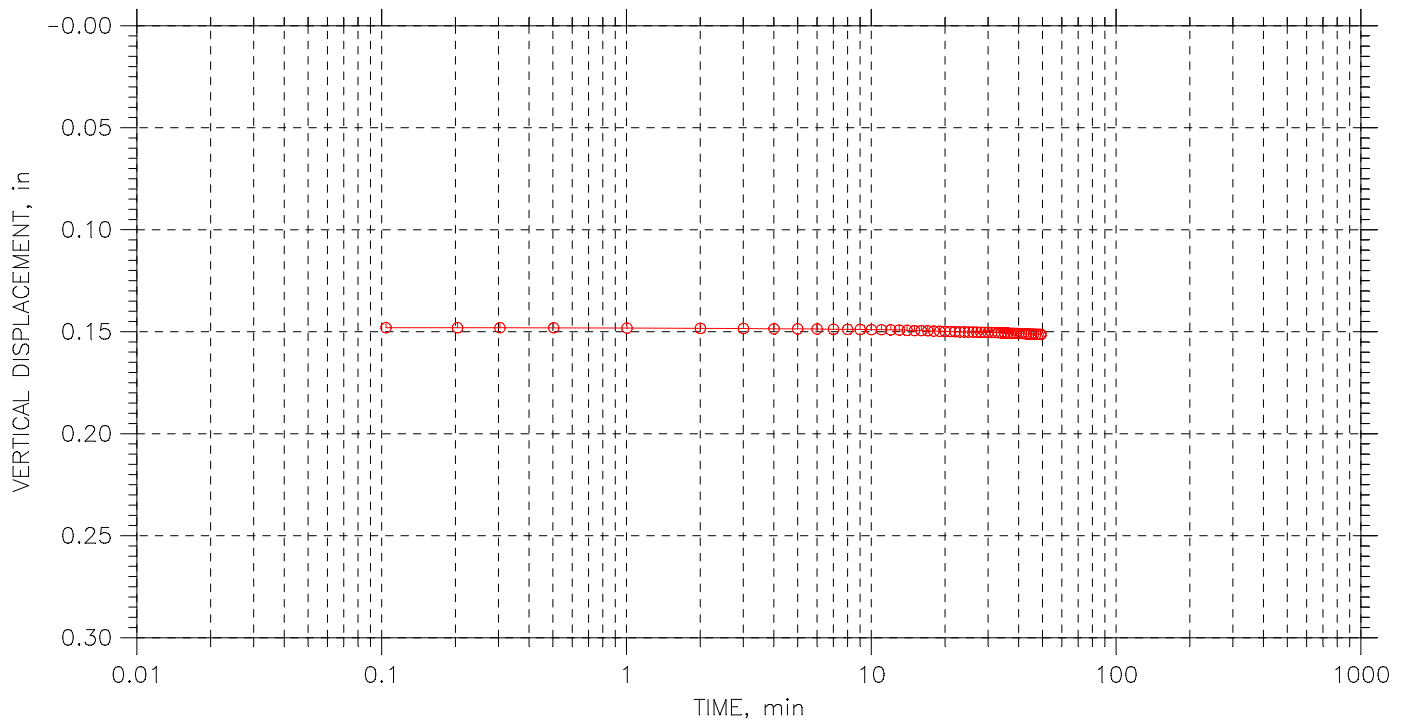
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 13 of 15

Stress: 34 psi



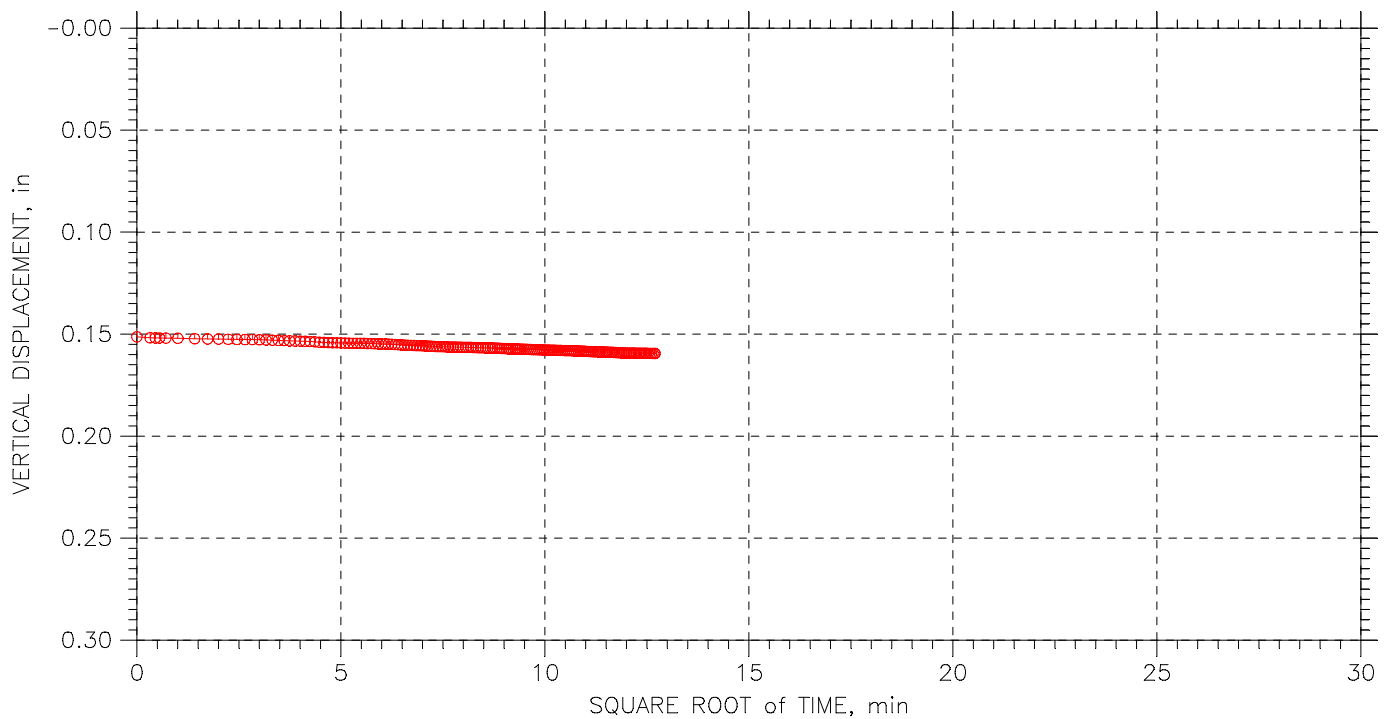
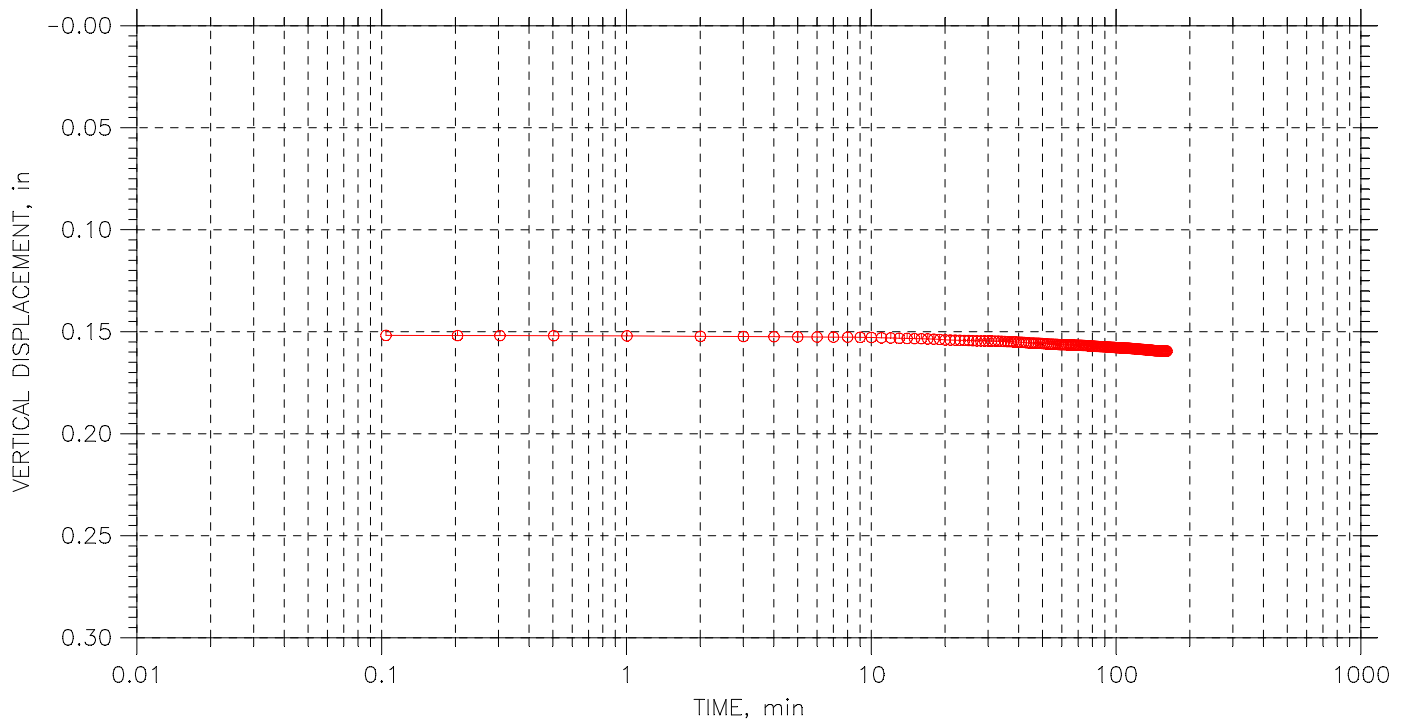
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Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

Step: 14 of 15

Stress: 37 psi



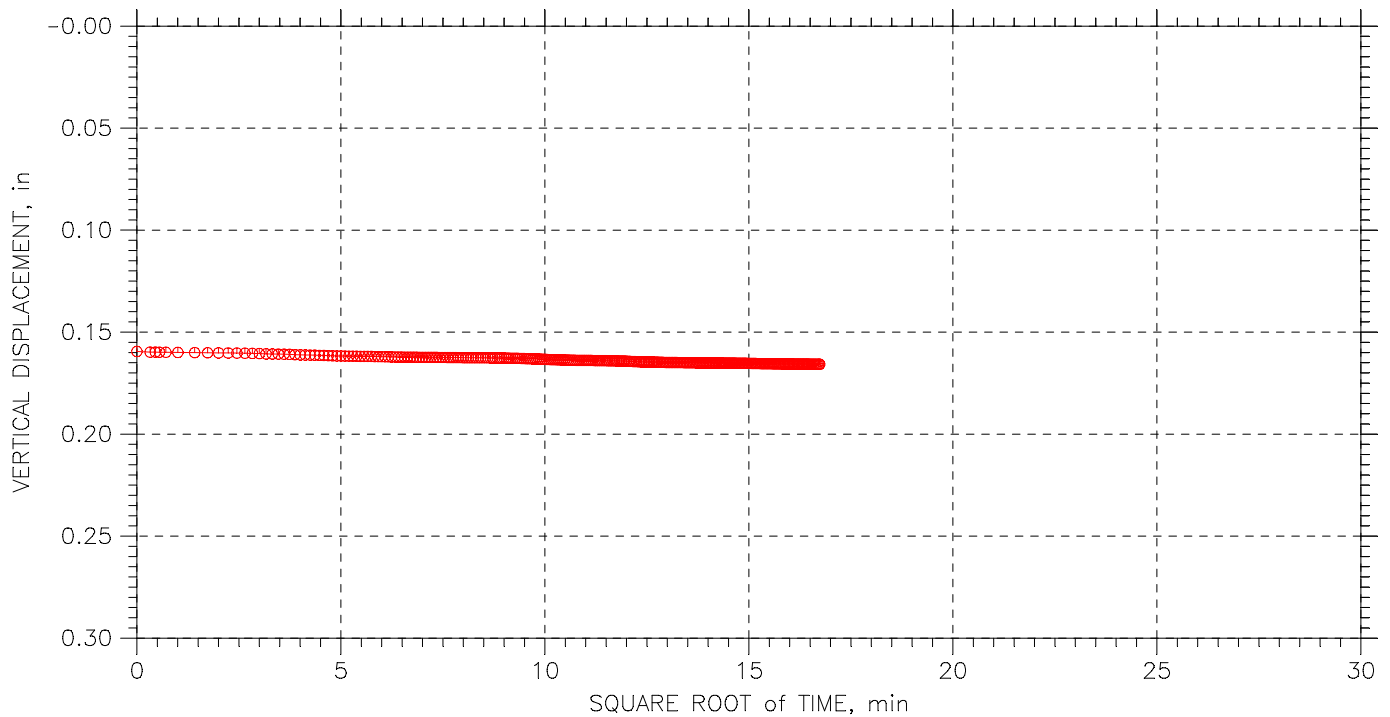
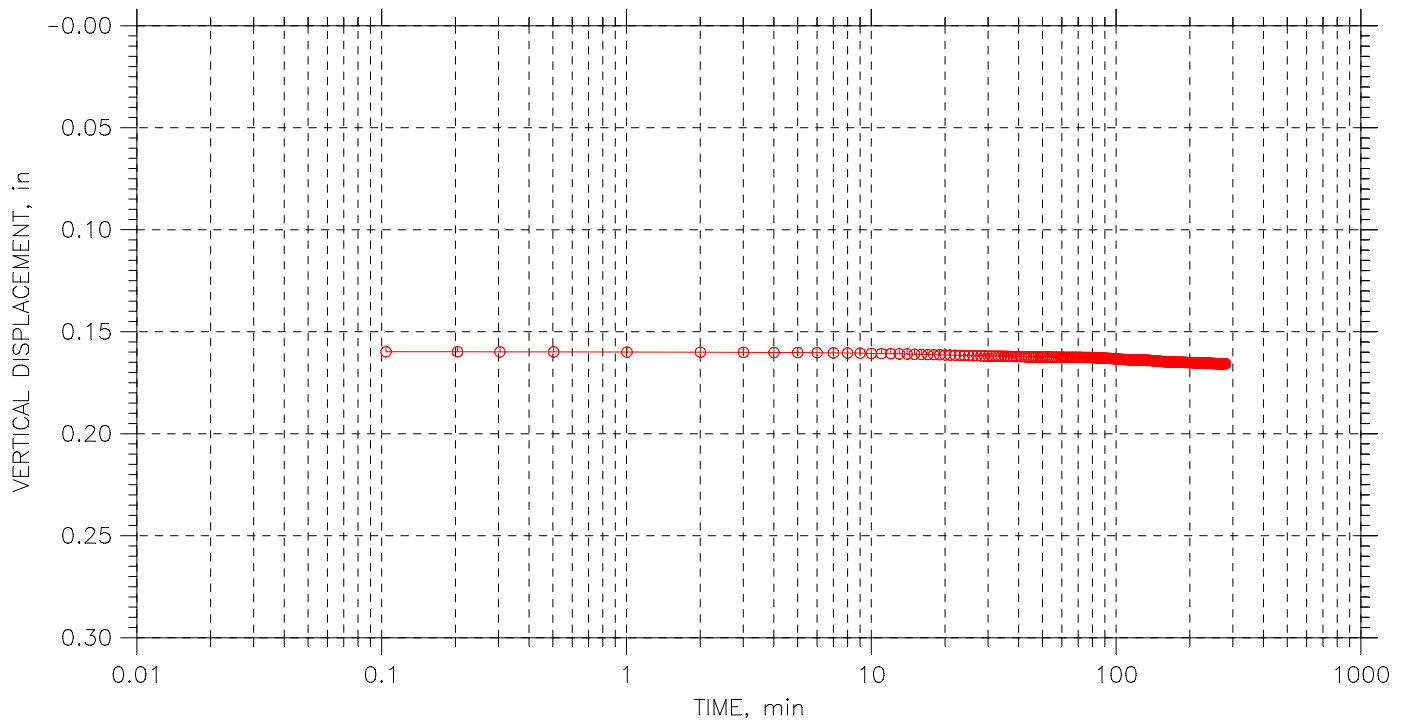
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

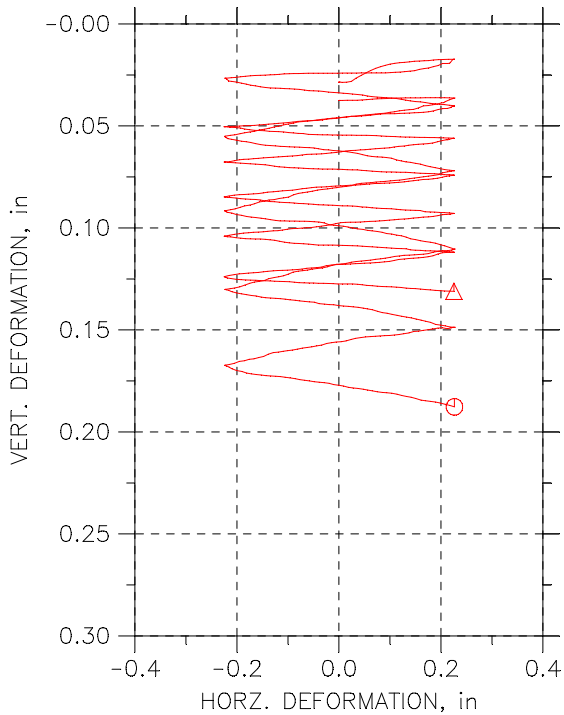
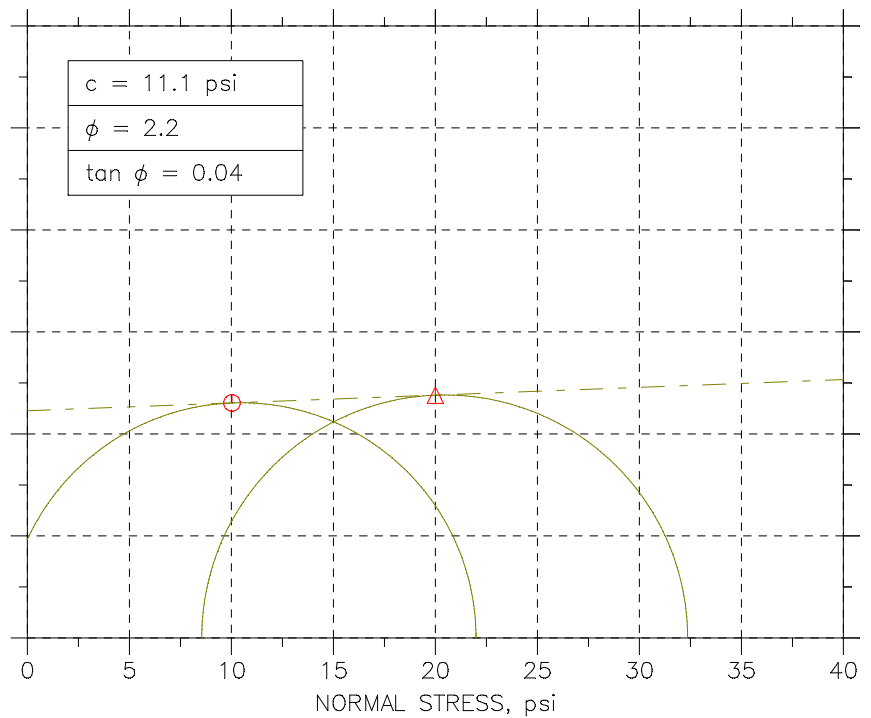
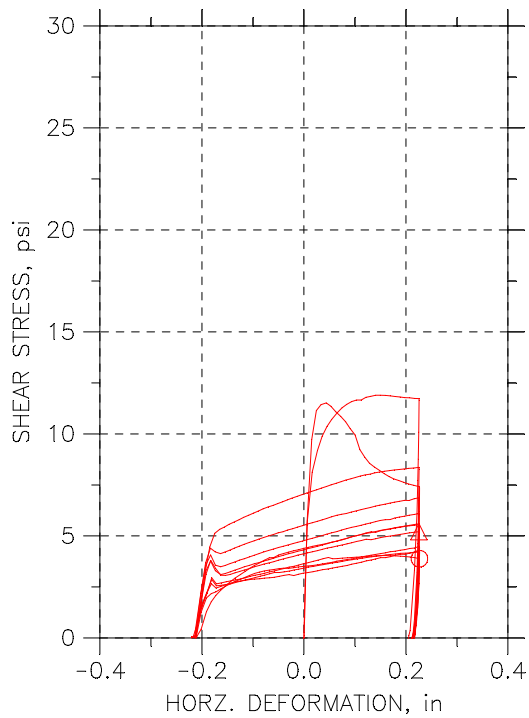
Step: 15 of 15

Stress: 40 psi



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

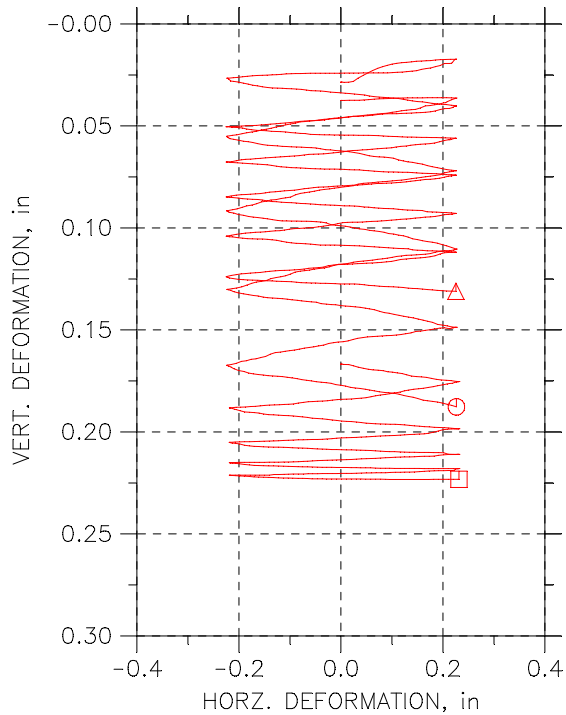
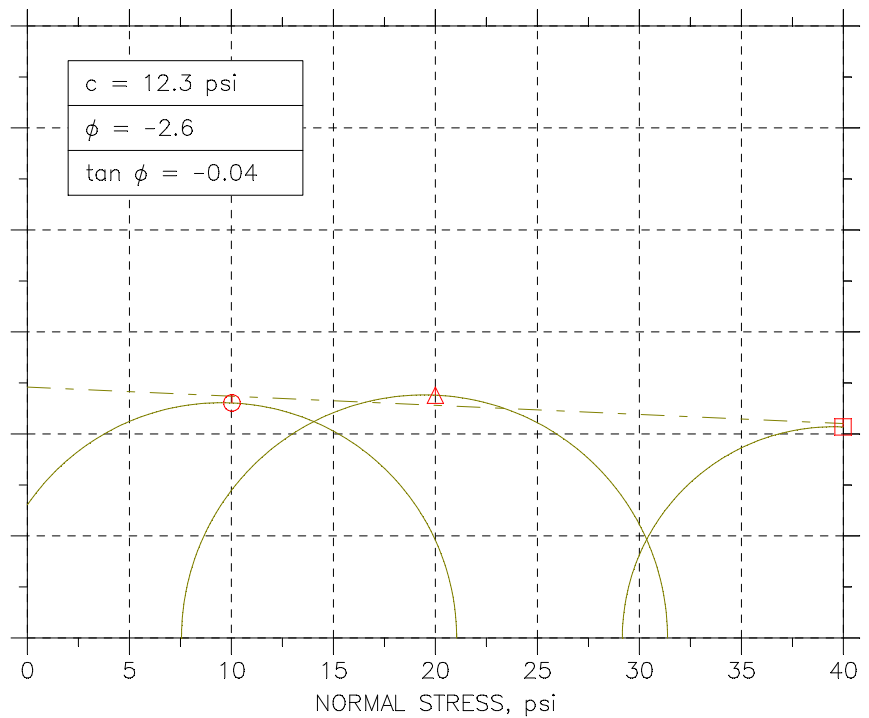
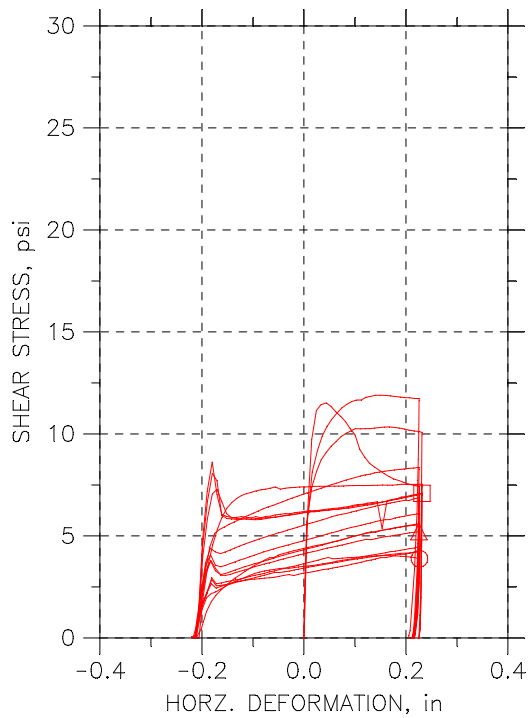
DIRECT SHEAR TEST REPORT



Symbol	⊙	△		
Test No.	1	2		
Sample No.	P-1	P-1		
Shape	Circular	Circular		
Initial	Dimension, in	2.75	2.75	
	Area, in ²	5.9396	5.9396	
	Height, in	1	1	
	Water Content, %	35.05	28.54	
	Dry Density, pcf	96.613	102.46	
	Saturation, %	127.10	119.44	
	Void Ratio	0.74465	0.64515	
Consol. Height, in		0.97805	0.9627	
Consol. Void Ratio		0.70636	0.5838	
Final	Water Content, %	27.46	24.59	
	Dry Density, pcf	118.94	117.91	
	Saturation, %	177.78	154.58	
	Void Ratio	0.41713	0.42949	
Normal Stress, psi		10.025	19.998	
. Shear Stress, psi		11.519	11.9	
Ult. Shear Stress, psi		3.8838	5.2087	
Time to Failure, min		5.0036	16.003	
Disp. Rate, in/min		0.01	0.01	
Estimated Specific Gravity		2.70	2.70	
Liquid Limit		50	50	
Plastic Limit		18	18	
Plasticity Index		32	32	

Project: Purple Line
 Location: Riverdale, MD
 Project No.: 14961
 Boring No.: RD-2A
 Sample Type: Pitcher
 Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)
 Remarks: Residual Direct Shear. 2-point summary; 3rd point disturbed.

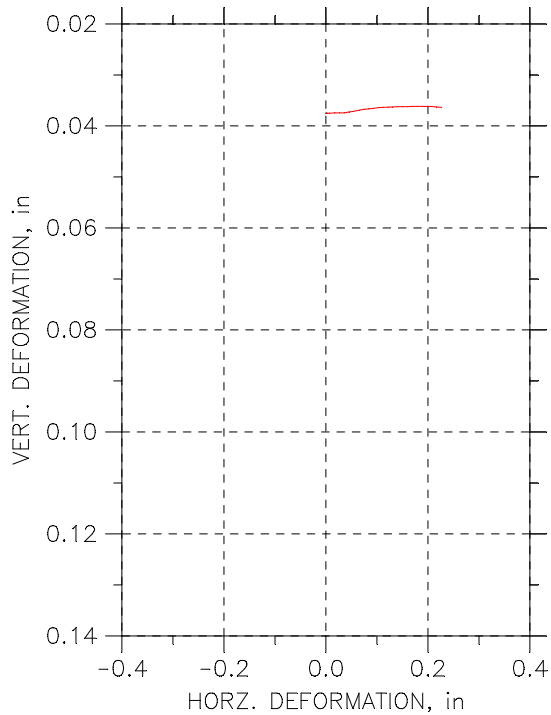
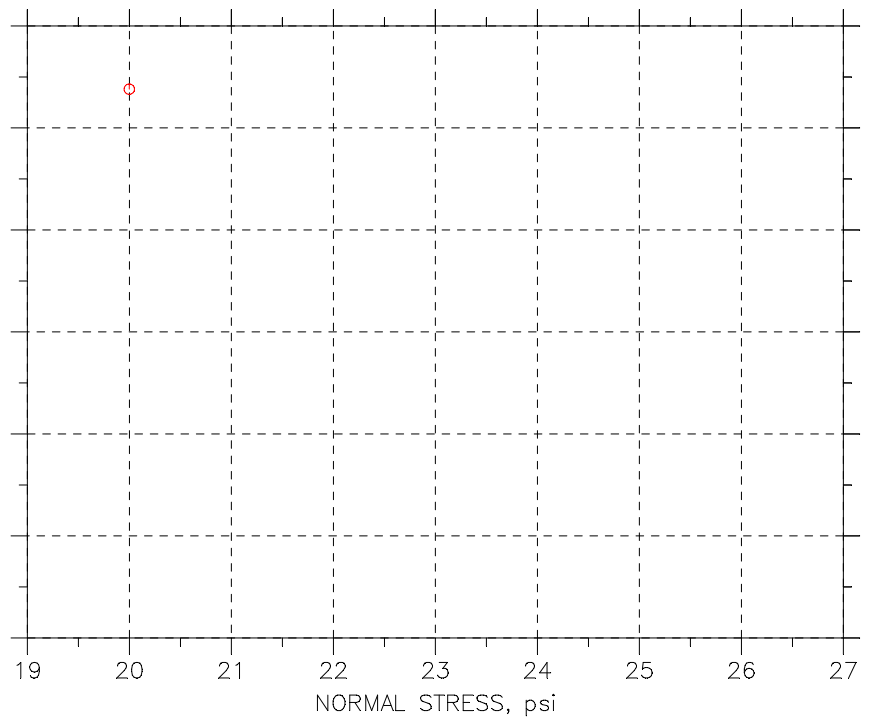
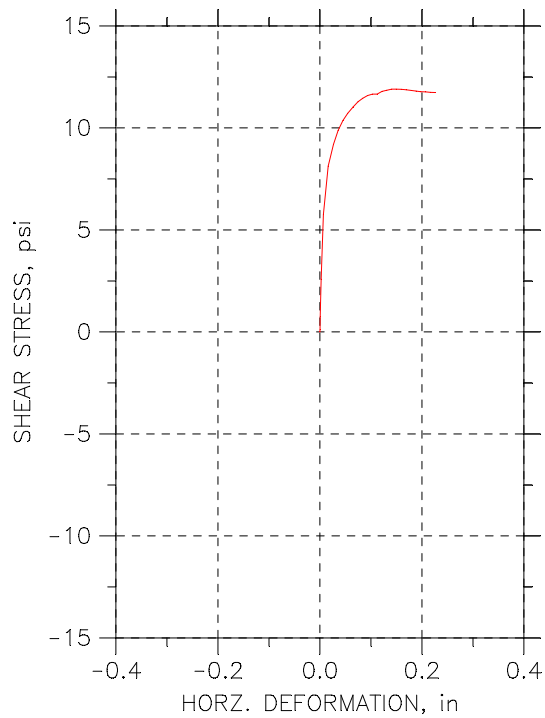
DIRECT SHEAR TEST REPORT



Symbol	⊖	△	□	
Test No.	1	2	3	
Sample No.	P-1	P-1	P-1	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	35.05	28.54	36.16
	Dry Density, pcf	96.613	102.46	87.947
	Saturation, %	127.10	119.44	106.52
	Void Ratio	0.74465	0.64515	0.91655
Consol. Height, in		0.97805	0.9627	0.83425
Consol. Void Ratio		0.70636	0.5838	0.59888
Final	Water Content, %	27.46	24.59	22.83
	Dry Density, pcf	118.94	117.91	113.23
	Saturation, %	177.78	154.58	126.13
	Void Ratio	0.41713	0.42949	0.48865
Normal Stress, psi		10.025	19.998	39.98
Max. Shear Stress, psi		11.519	11.9	10.343
Shear Stress, psi		3.8838	5.2087	7.0885
Time to Failure, min		5.0036	16.003	18.003
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		50	50	50
Plastic Limit		18	18	18
Plasticity Index		32	32	32

Project: Purple Line
 Location: Riverdale, MD
 Project No.: 14961
 Boring No.: RD-2A
 Sample Type: Pitcher
 Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)
 Remarks: Residual Direct Shear. 3-point summary; 3rd point disturbed.

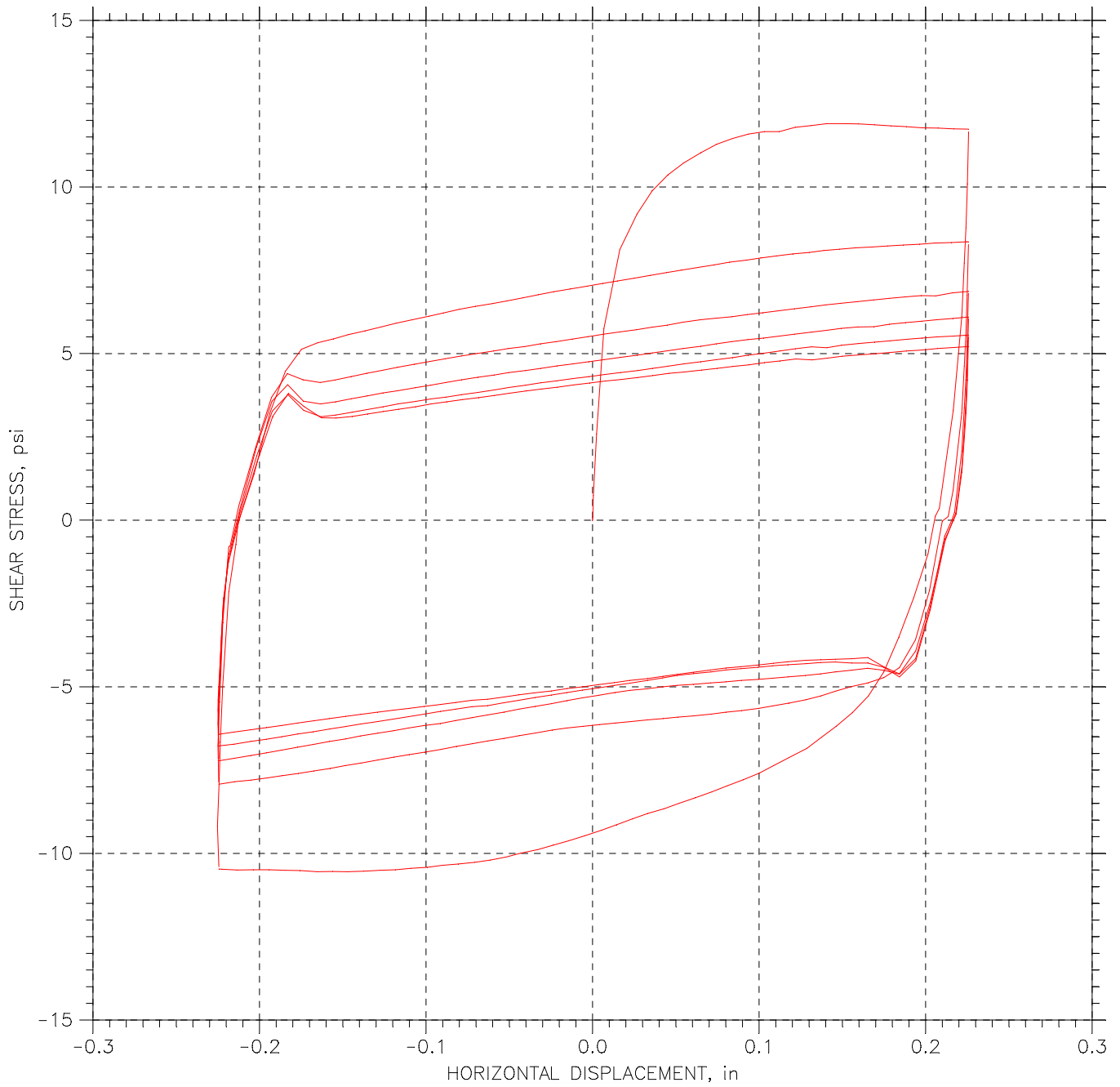
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	2			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	28.54		
	Dry Density, pcf	102.5		
	Saturation, %	119.44		
	Void Ratio	0.64515		
Consol. Height, in		0.9627		
Consol. Void Ratio		0.5838		
Final	Water Content, %	24.59		
	Dry Density, pcf	117.9		
	Saturation, %	154.58		
	Void Ratio	0.42949		
Normal Stress, psi		19.998		
Max. Shear Stress, psi		11.9		
Ult. Shear Stress, psi		11.734		
Time to Failure, min		15.003		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		18		
Plasticity Index		32		

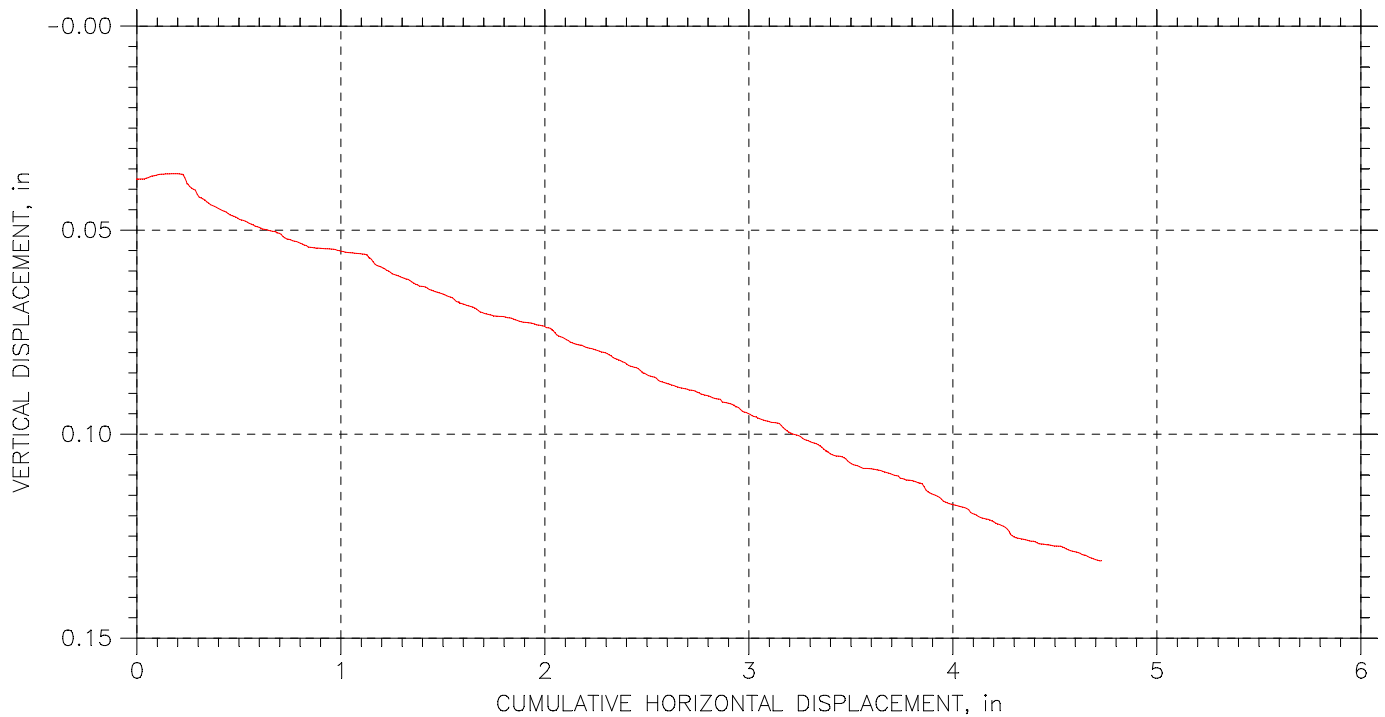
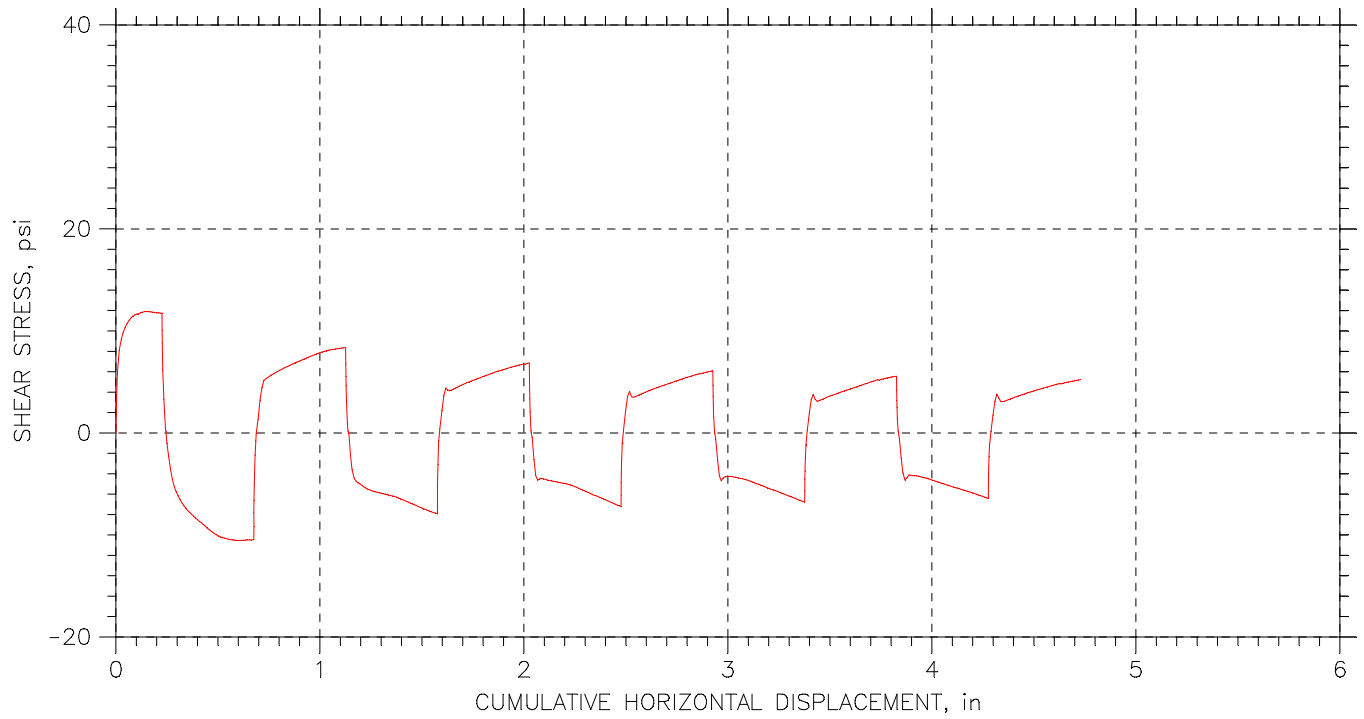
Project: Purple Line
 Location: Riverdale, MD
 Project No.: 14961
 Boring No.: RD-2A
 Sample Type: Pitcher
 Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)
 Remarks: Residual Direct Shear.

RESIDUAL SHEAR TEST



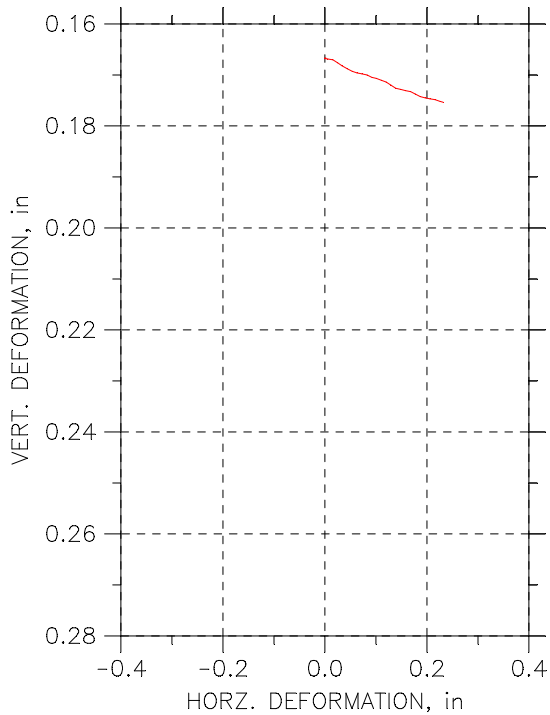
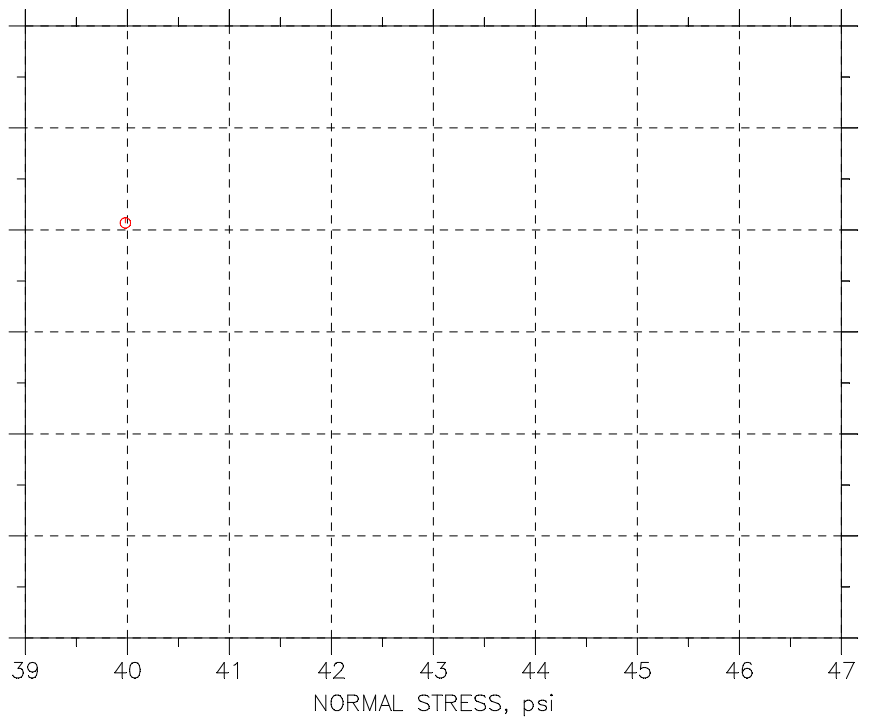
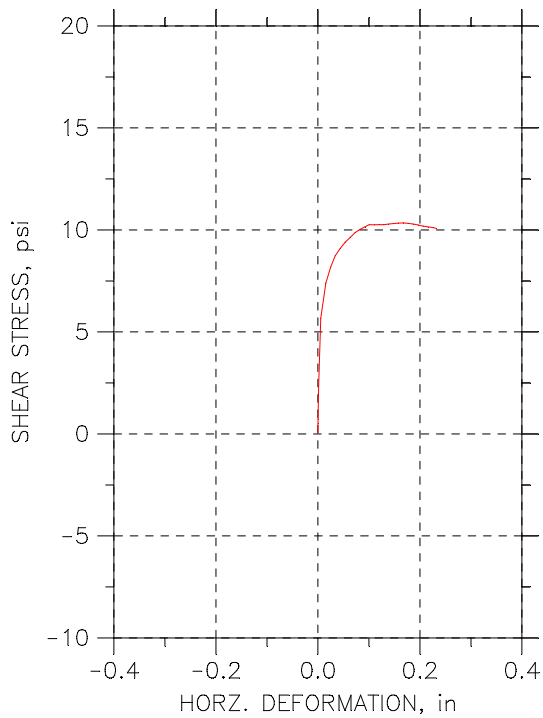
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.5
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear.		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.5
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist Stiff Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear.		
File: \\Server1\laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

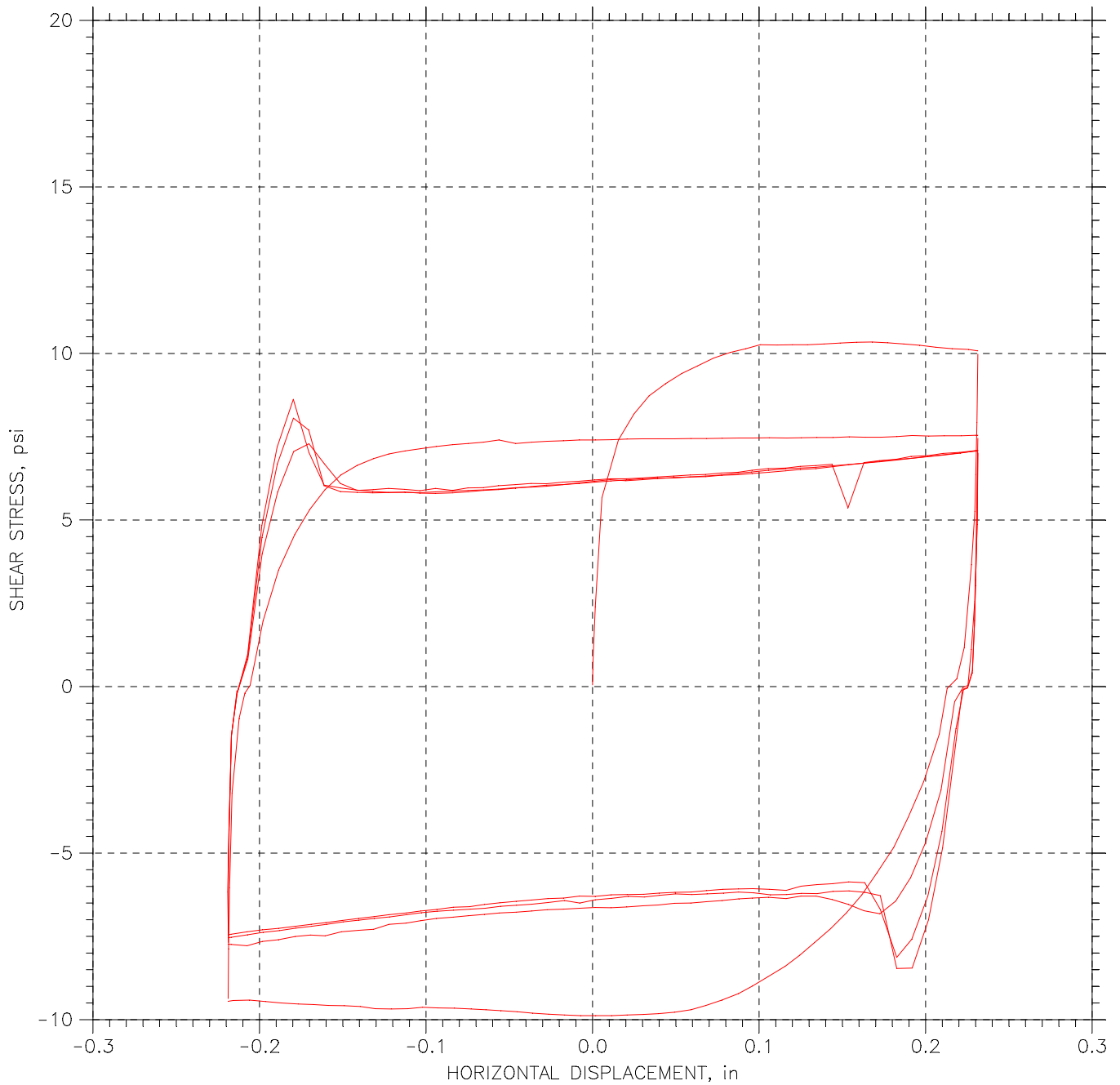
DIRECT SHEAR TEST REPORT



Symbol				
Test No.	3			
Sample No.	P-1			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	36.16		
	Dry Density, pcf	87.95		
	Saturation, %	106.52		
	Void Ratio	0.91655		
Consol. Height, in		0.83425		
Consol. Void Ratio		0.59888		
Final	Water Content, %	22.83		
	Dry Density, pcf	113.2		
	Saturation, %	126.13		
	Void Ratio	0.48865		
Normal Stress, psi		39.98		
Max. Shear Stress, psi		10.343		
Ult. Shear Stress, psi		10.078		
Time to Failure, min		18.003		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		50		
Plastic Limit		18		
Plasticity Index		32		

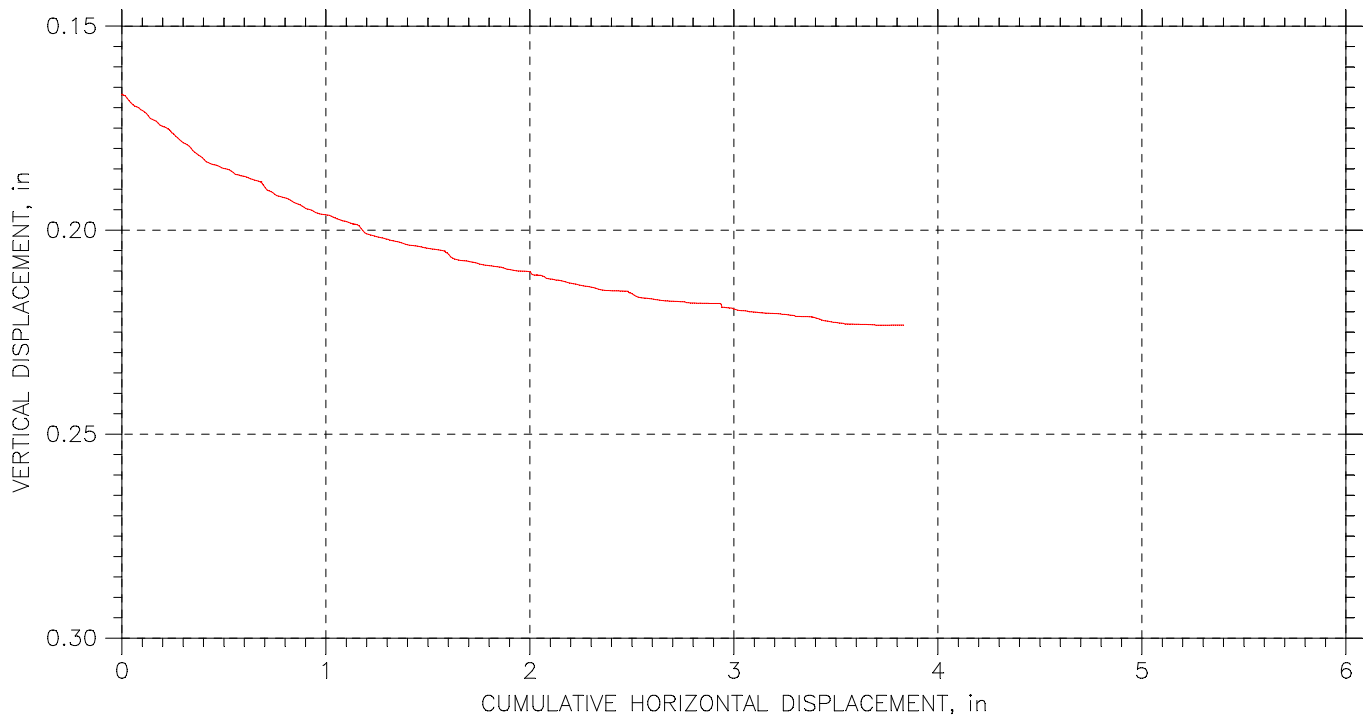
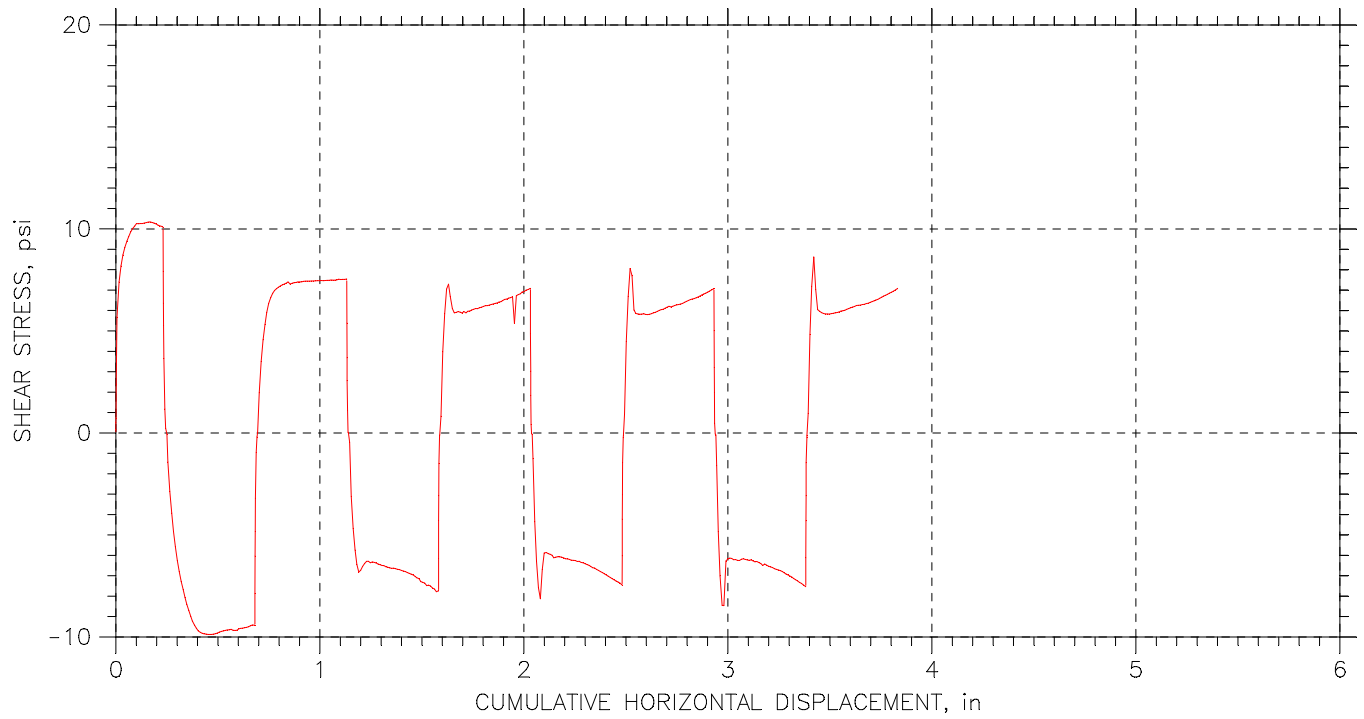
Project: Purple Line	
Location: Riverdale, MD	
Project No.: 14961	
Boring No.: RD-2A	
Sample Type: Pitcher	
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)	
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.	

RESIDUAL SHEAR TEST



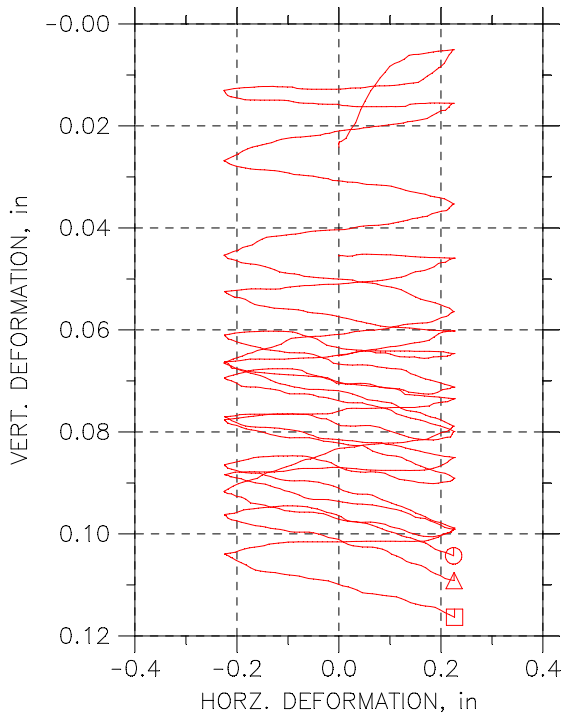
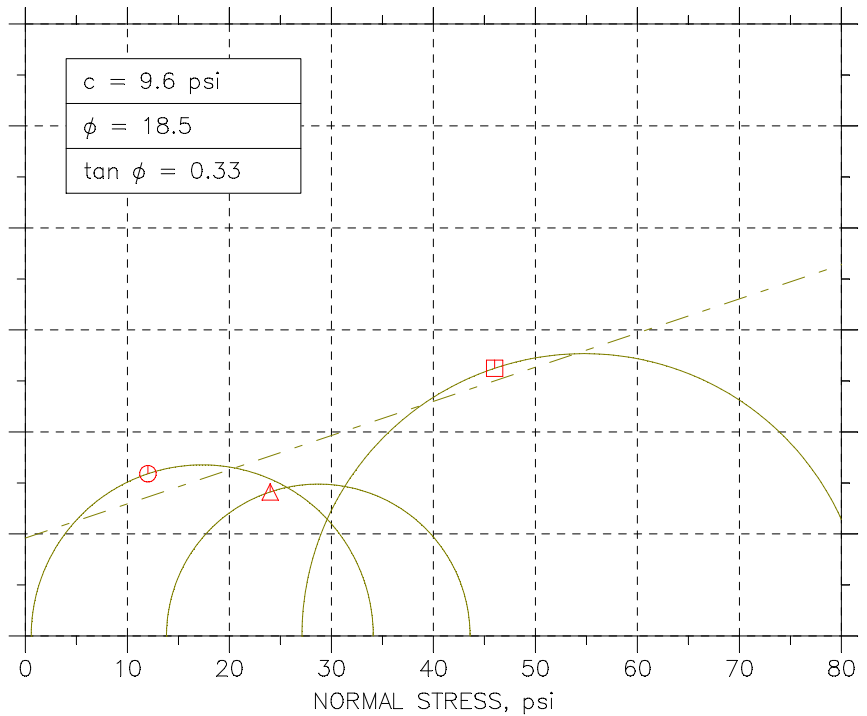
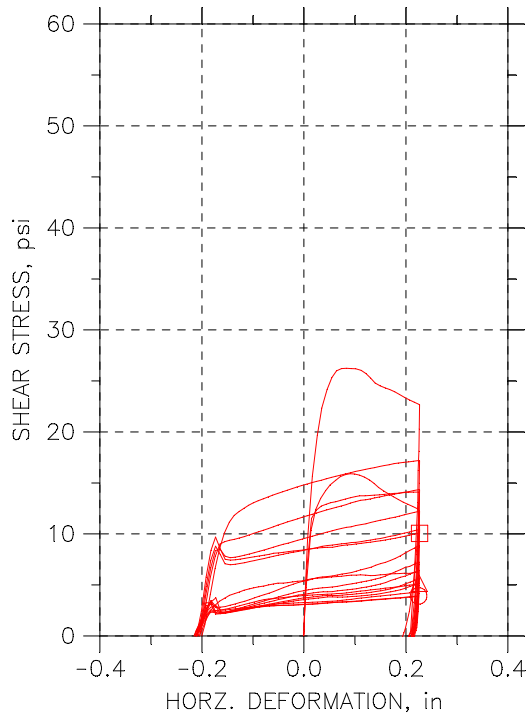
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-2A	Tested By: Gladys A	Checked By: bert
Sample No.: P-1	Test Date: 9/18/07	Depth: 34.7
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist Very Soft Mottled Red Brown and Gray CLAY. (CH)		
Remarks: Residual Direct Shear. Material disturbed. Consolidated in multiple steps to allow proper consolidation.		
File: \\Server1\\laboratory\\Geocomp Software\\PROJECTS\\14961-0 E2CR -Purple Line\\Residual Direct Shear\\Residual Shear RD-		

DIRECT SHEAR TEST REPORT



Symbol	⊖	△	□	
Test No.	1	2	3	
Sample No.	P-2	P-2	P-2	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	25.44	28.49	25.53
	Dry Density, pcf	105.04	102.79	104.46
	Saturation, %	113.59	120.23	112.34
	Void Ratio	0.60467	0.63982	0.61364
Consol. Height, in		0.97864	0.93845	0.9545
Consol. Void Ratio		0.5704	0.53888	0.54022
Final	Water Content, %	27.37	23.17	23.04
	Dry Density, pcf	117.27	115.38	118.21
	Saturation, %	168.97	135.78	146.09
	Void Ratio	0.43731	0.46085	0.42589
Normal Stress, psi		12.011	23.988	45.998
Max. Shear Stress, psi		15.899	14.111	26.242
Shear Stress, psi		3.9252	5.1508	10.053
Time to Failure, min		10.003	24.19	9.0034
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		46	46	46
Plastic Limit		18	18	18
Plasticity Index		28	28	28

Project: Purple Line

Location: Riverdale, MD

Project No.: 14961

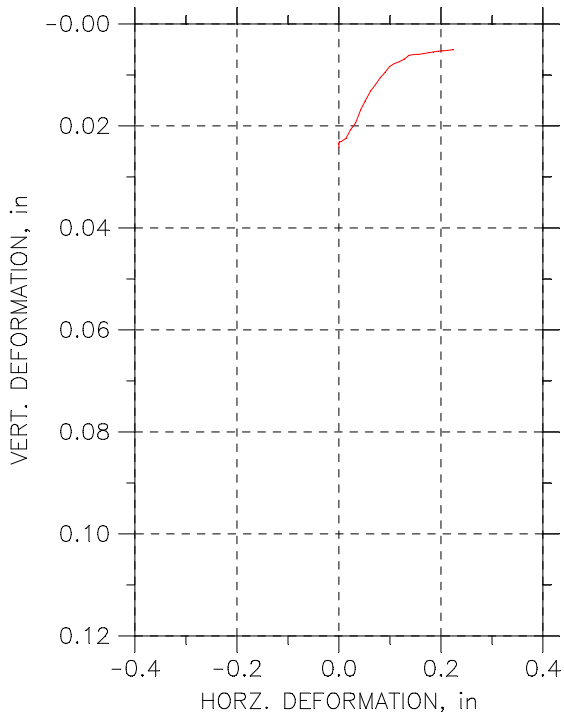
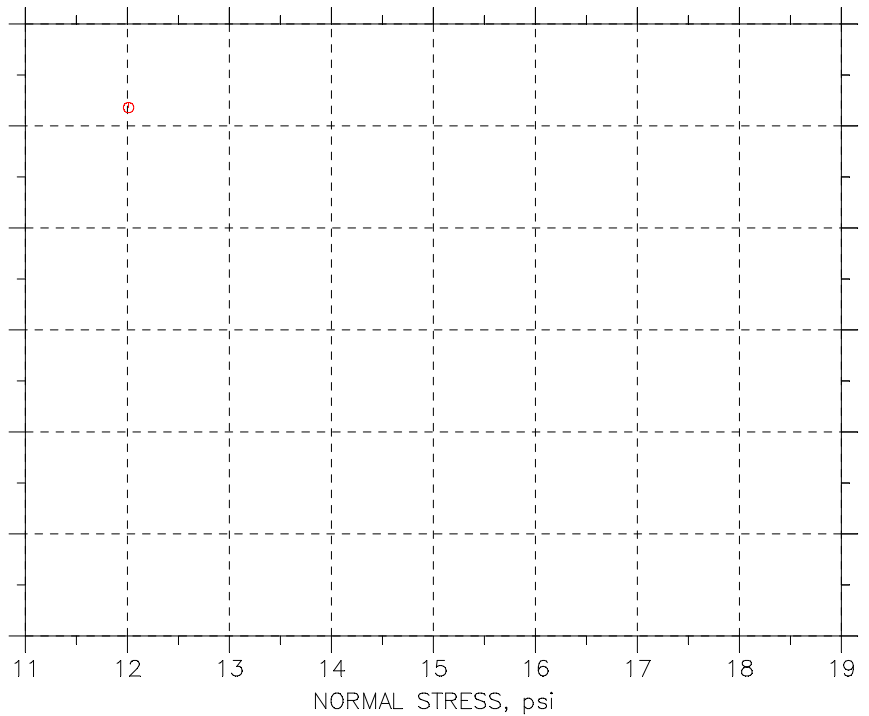
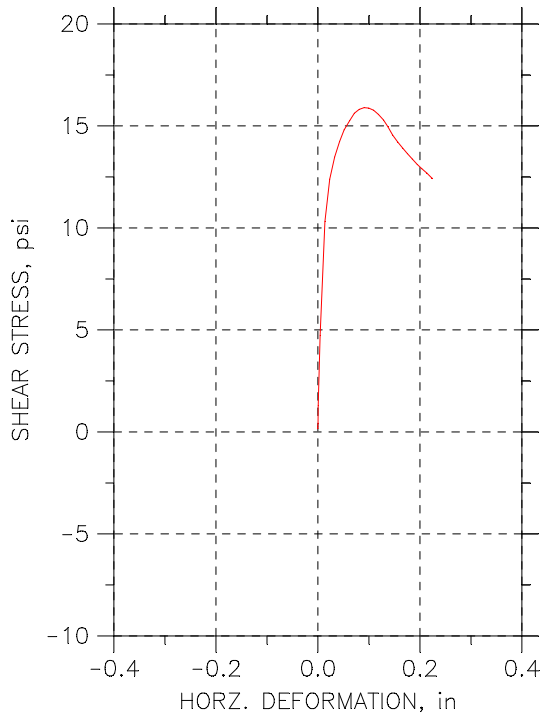
Boring No.: RD-3A

Sample Type: Pitcher

Description: Moist, Stiff, Dark Gray CLAY. (CL)

Remarks: Residual Direct Shear

DIRECT SHEAR TEST REPORT



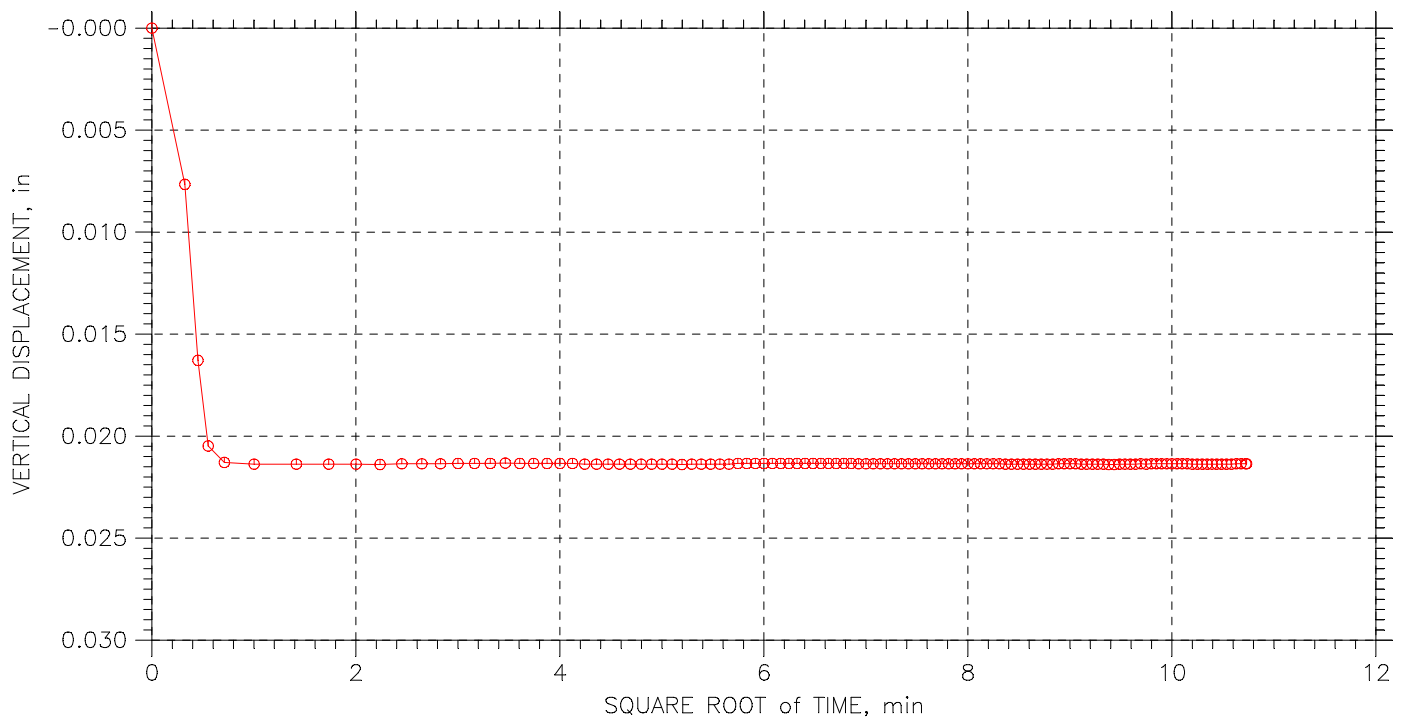
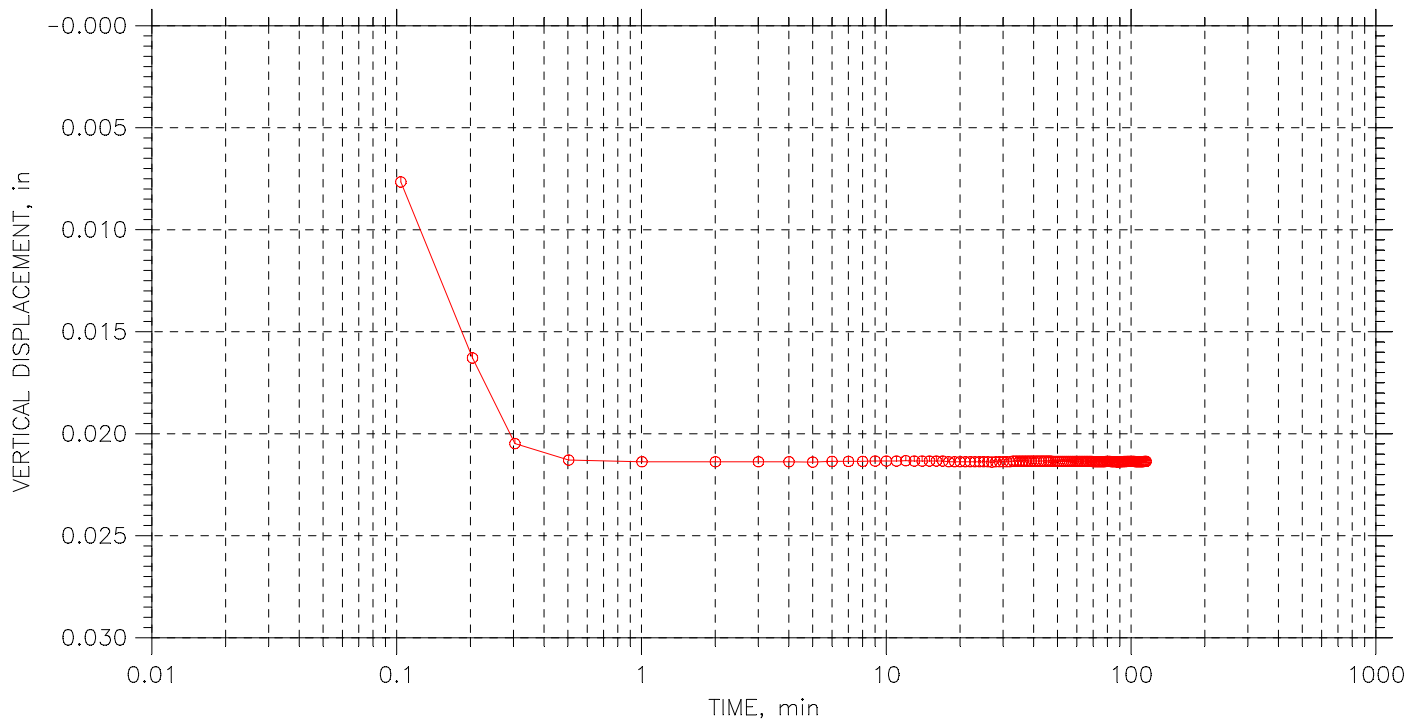
Symbol				
Test No.	1			
Sample No.	P-2			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	25.44		
	Dry Density, pcf	105.		
	Saturation, %	113.59		
	Void Ratio	0.60467		
Consol. Height, in		0.97864		
Consol. Void Ratio		0.5704		
Final	Water Content, %	27.37		
	Dry Density, pcf	117.3		
	Saturation, %	168.97		
	Void Ratio	0.43731		
Normal Stress, psi		12.011		
Max. Shear Stress, psi		15.899		
Ult. Shear Stress, psi		12.413		
Time to Failure, min		10.003		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		46		
Plastic Limit		18		
Plasticity Index		28		
Project: Purple Line				
Location: Riverdale, MD				
Project No.: 14961				
Boring No.: RD-3A				
Sample Type: Pitcher				
Description: Moist, Stiff, Dark Gray CLAY. (CL)				
Remarks: Residual Direct Shear				

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

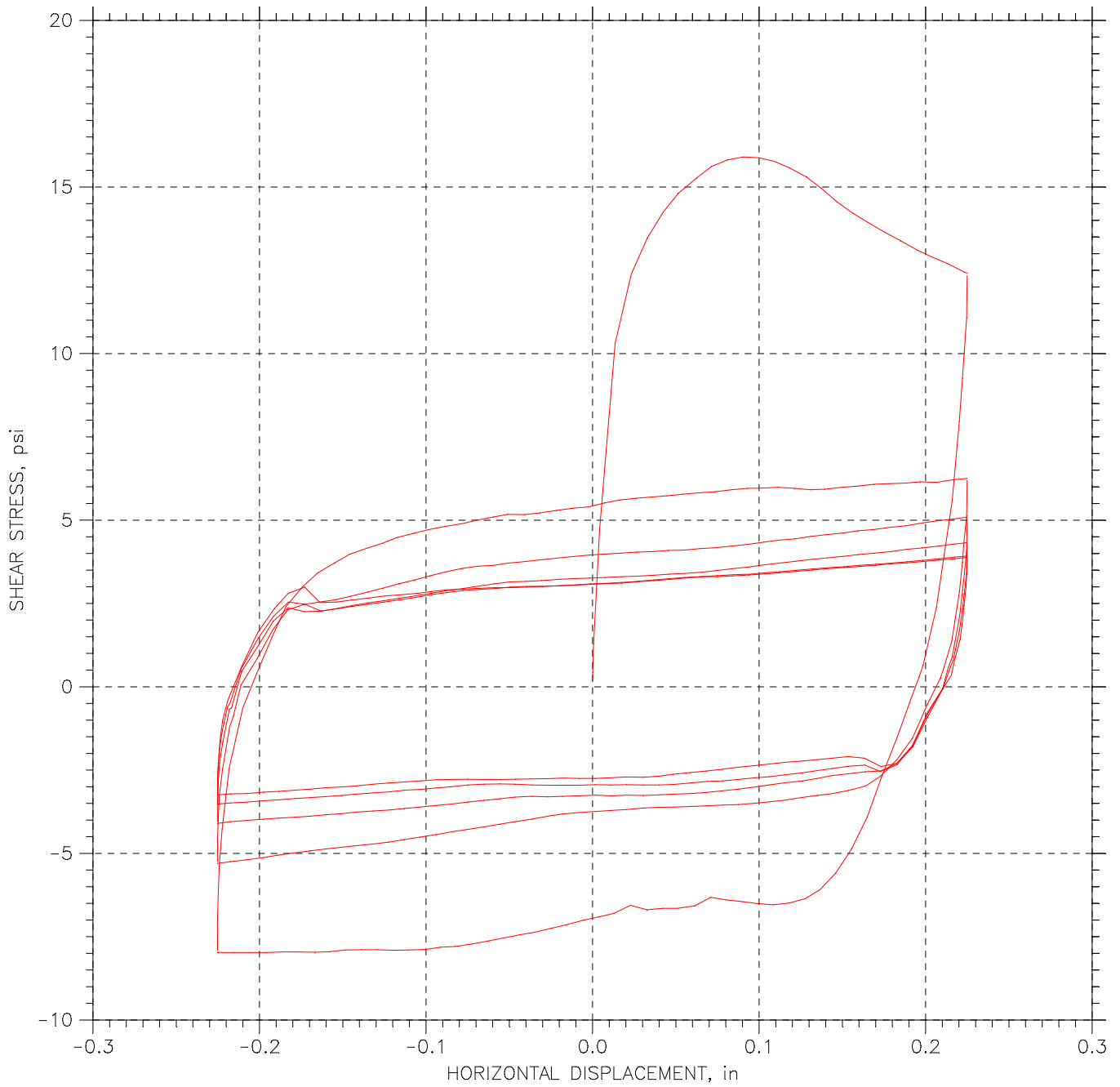
Step: 1 of 1

Stress: 12 psi



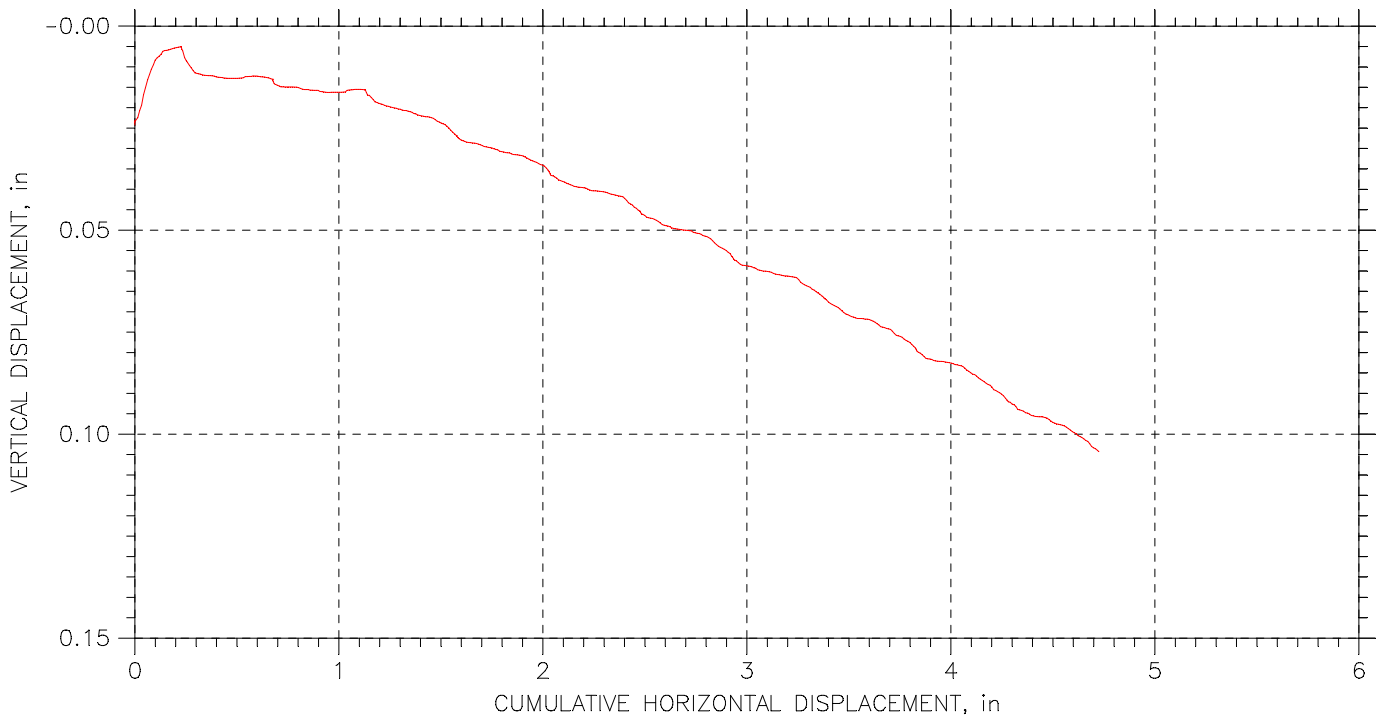
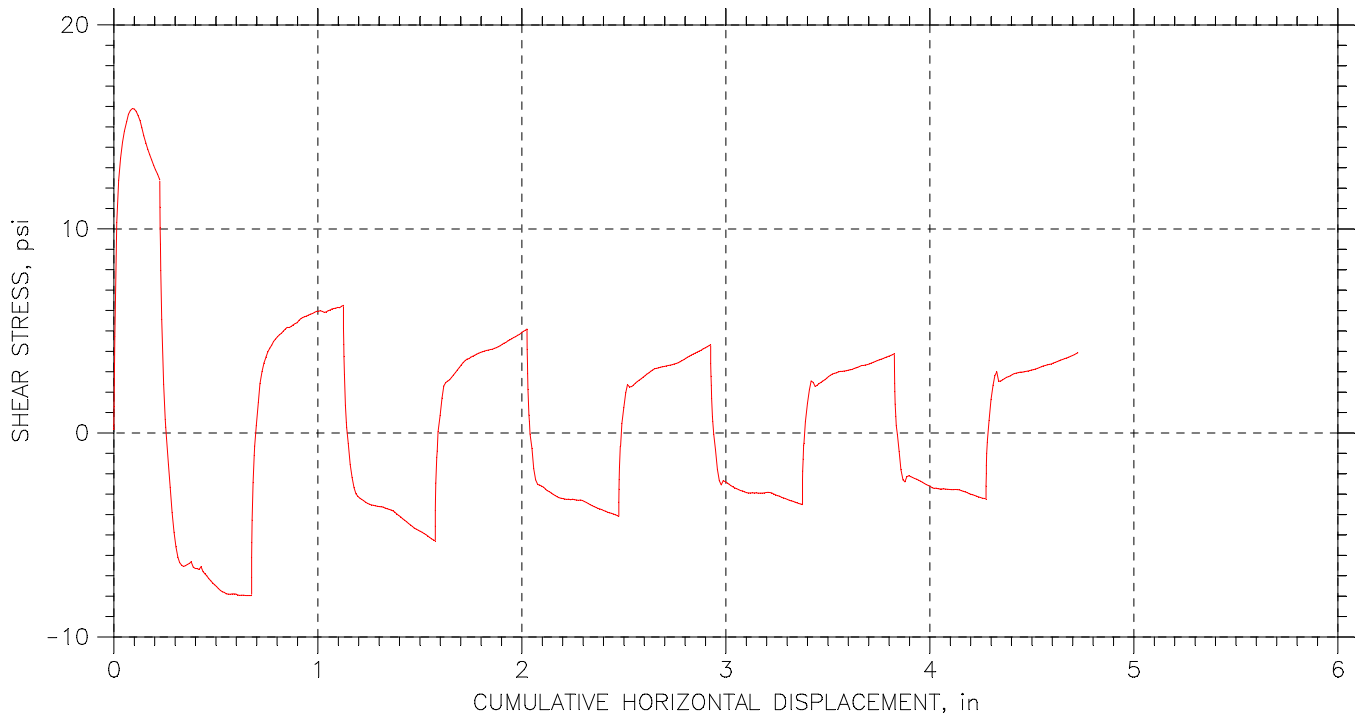
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-2	Test Date: 9/13/07	Depth: 35'-38'
Test No.: 1	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



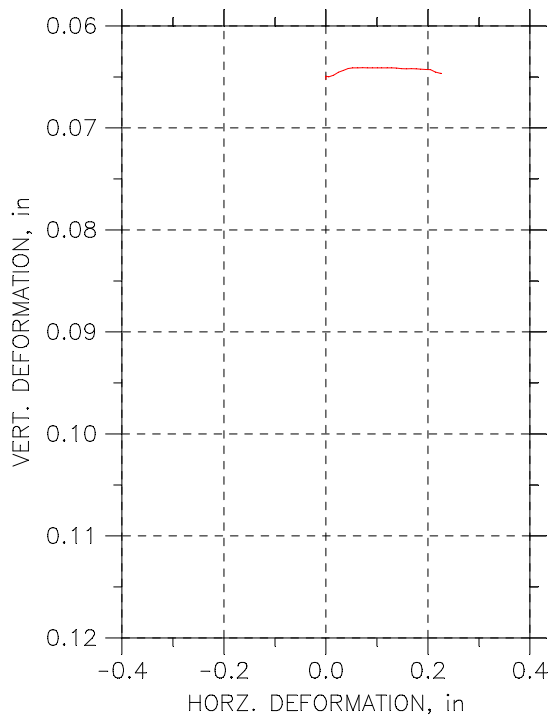
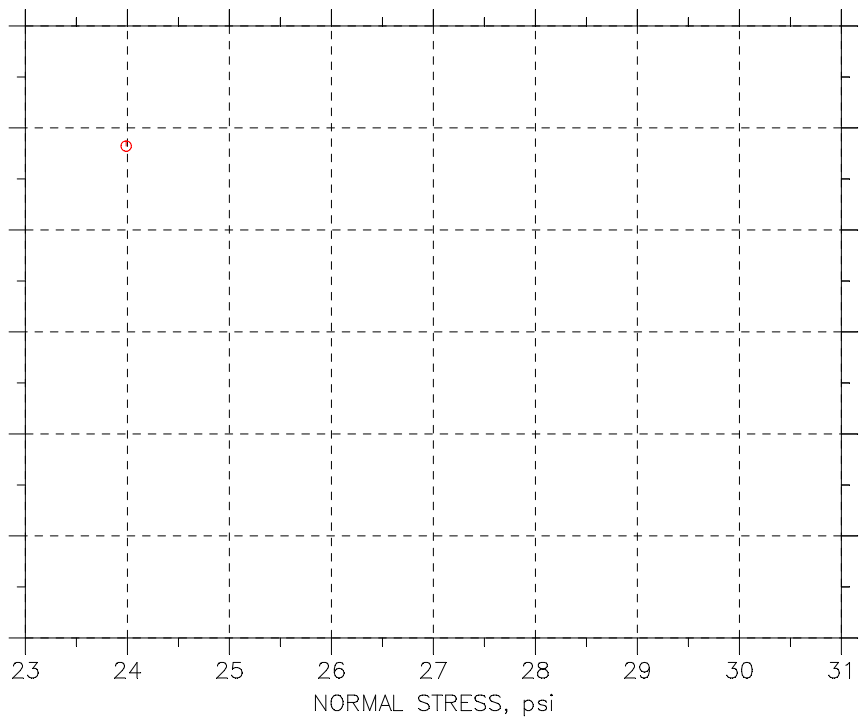
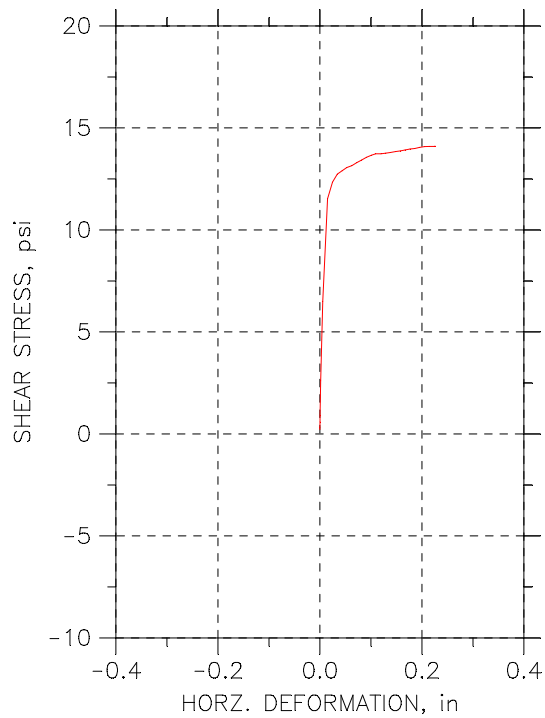
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-2	Test Date: 9/13/07	Depth:
Test No.: 1	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-2	Test Date: 9/13/07	Depth:
Test No.: 1	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST REPORT



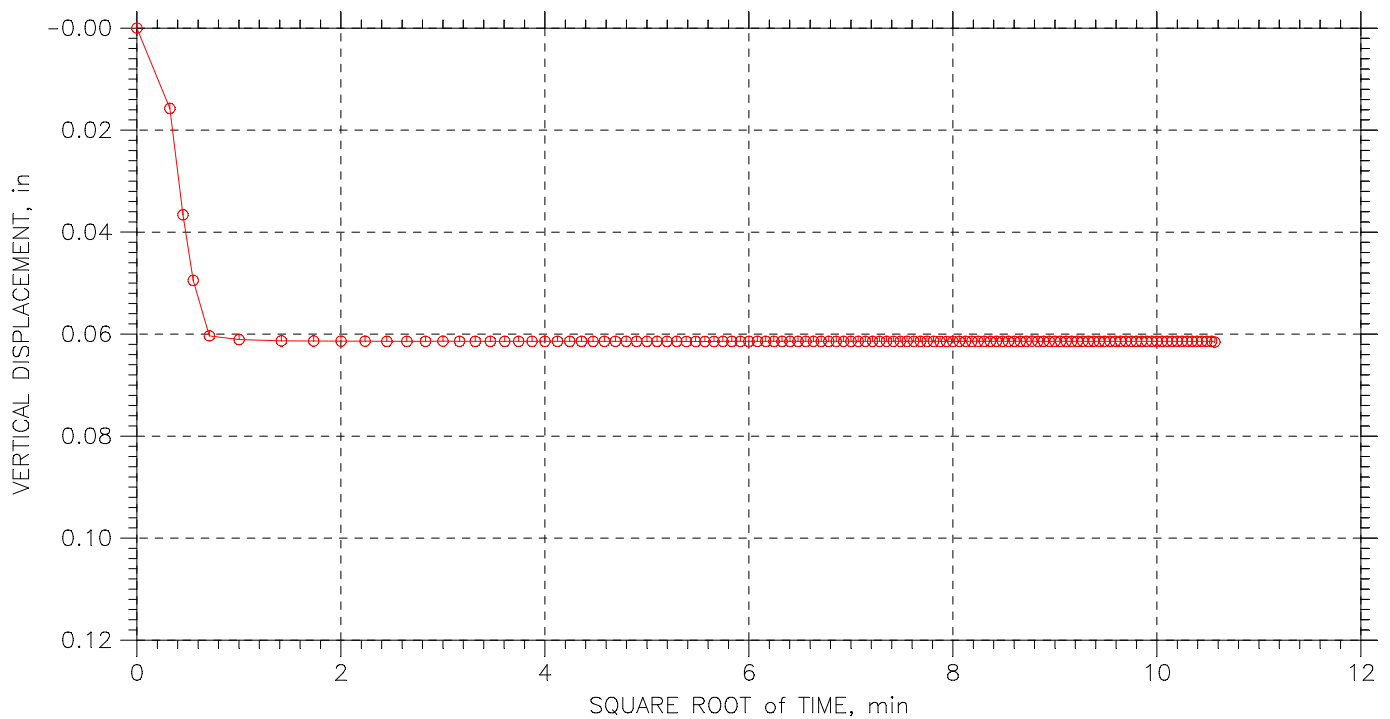
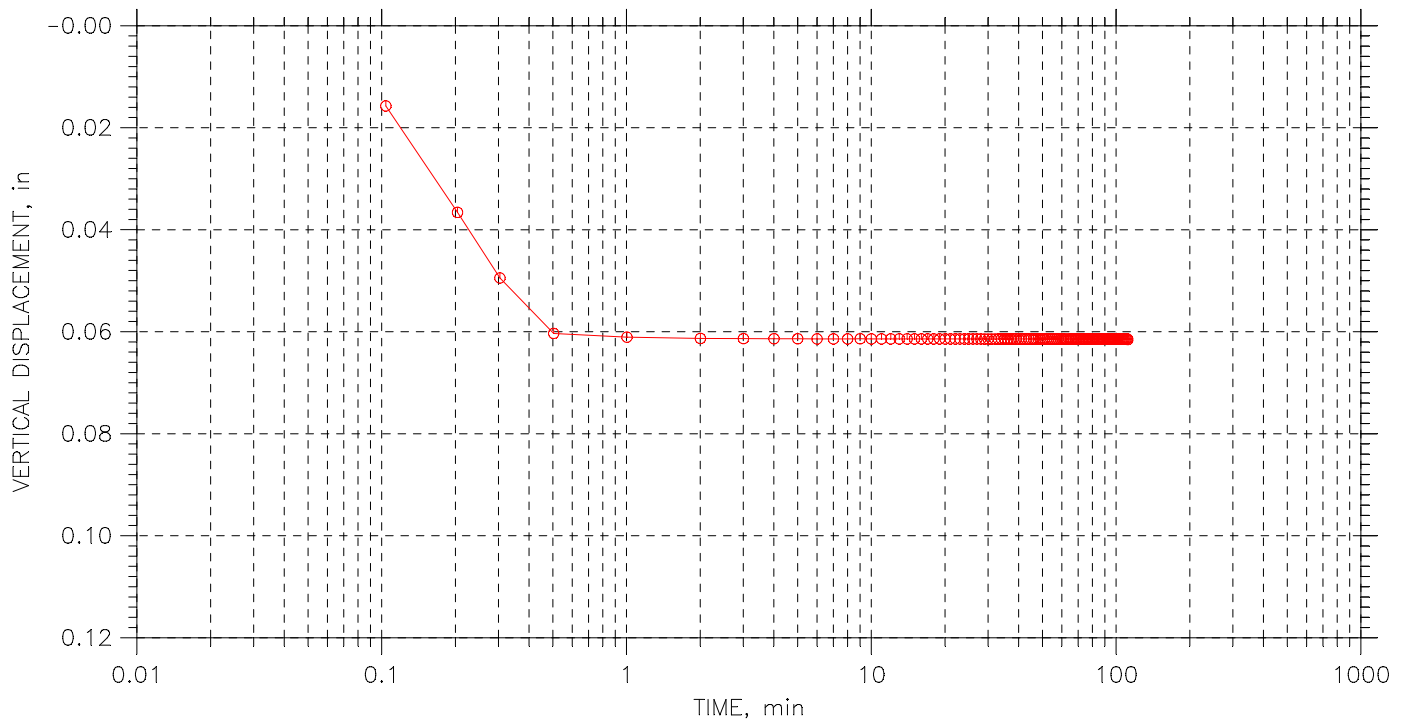
Symbol				
Test No.	2			
Sample No.	P-2			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	28.49		
	Dry Density, pcf	102.8		
	Saturation, %	120.23		
	Void Ratio	0.63982		
Consol. Height, in		0.93845		
Consol. Void Ratio		0.53888		
Final	Water Content, %	23.17		
	Dry Density, pcf	115.4		
	Saturation, %	135.78		
	Void Ratio	0.46085		
Normal Stress, psi		23.988		
Max. Shear Stress, psi		14.111		
Ult. Shear Stress, psi		14.111		
Time to Failure, min		24.19		
Disp. Rate, in/min		0.01		
Estimated Specific Gravity		2.70		
Liquid Limit		46		
Plastic Limit		18		
Plasticity Index		28		
Project: Purple Line				
Location: Riverdale, MD				
Project No.: 14961				
Boring No.: RD-3A				
Sample Type: Pitcher				
Description: Moist, Stiff, Dark Gray CLAY. (CL)				
Remarks: Residual Direct Shear				

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

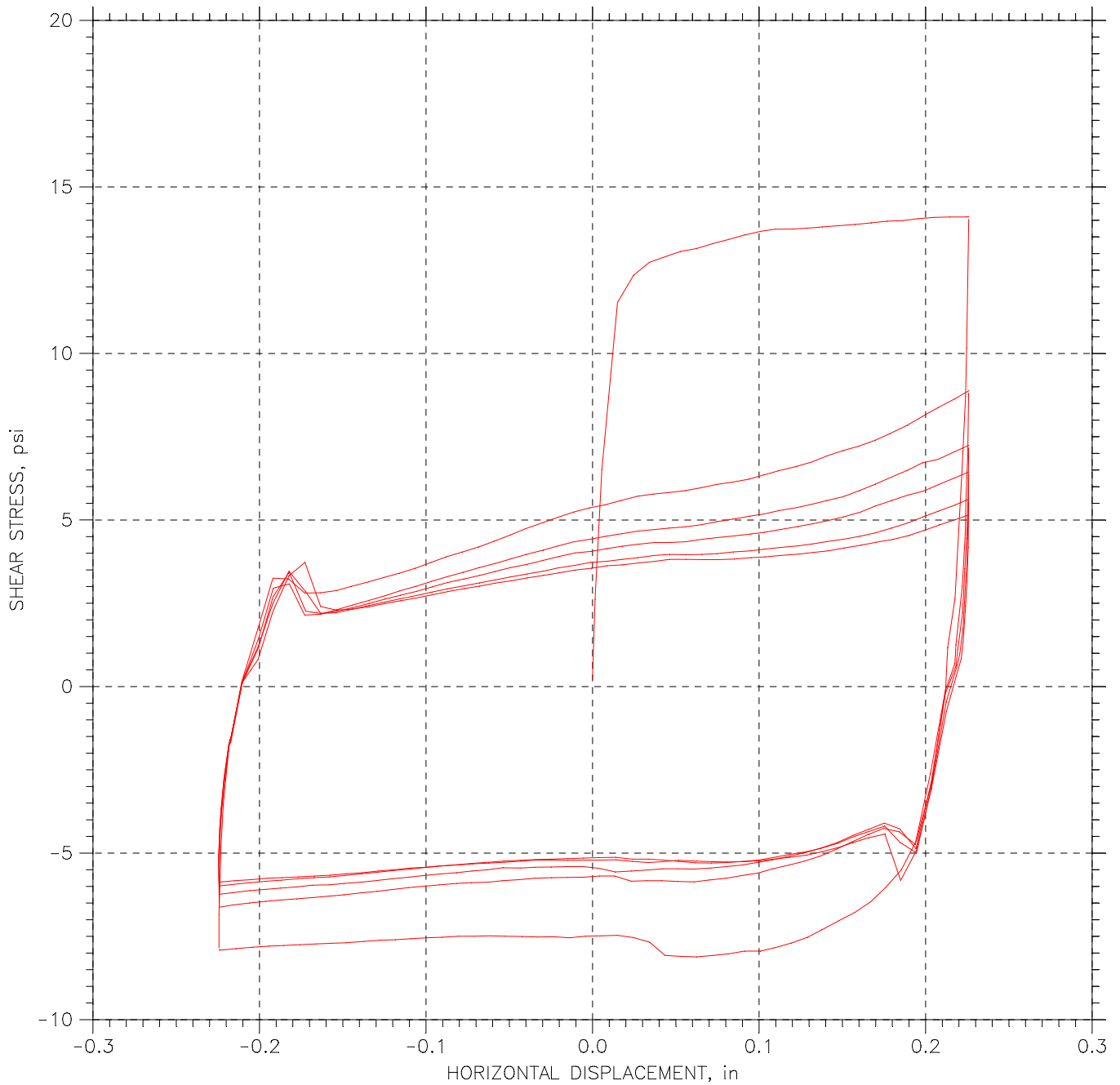
Step: 1 of 1

Stress: 24 psi



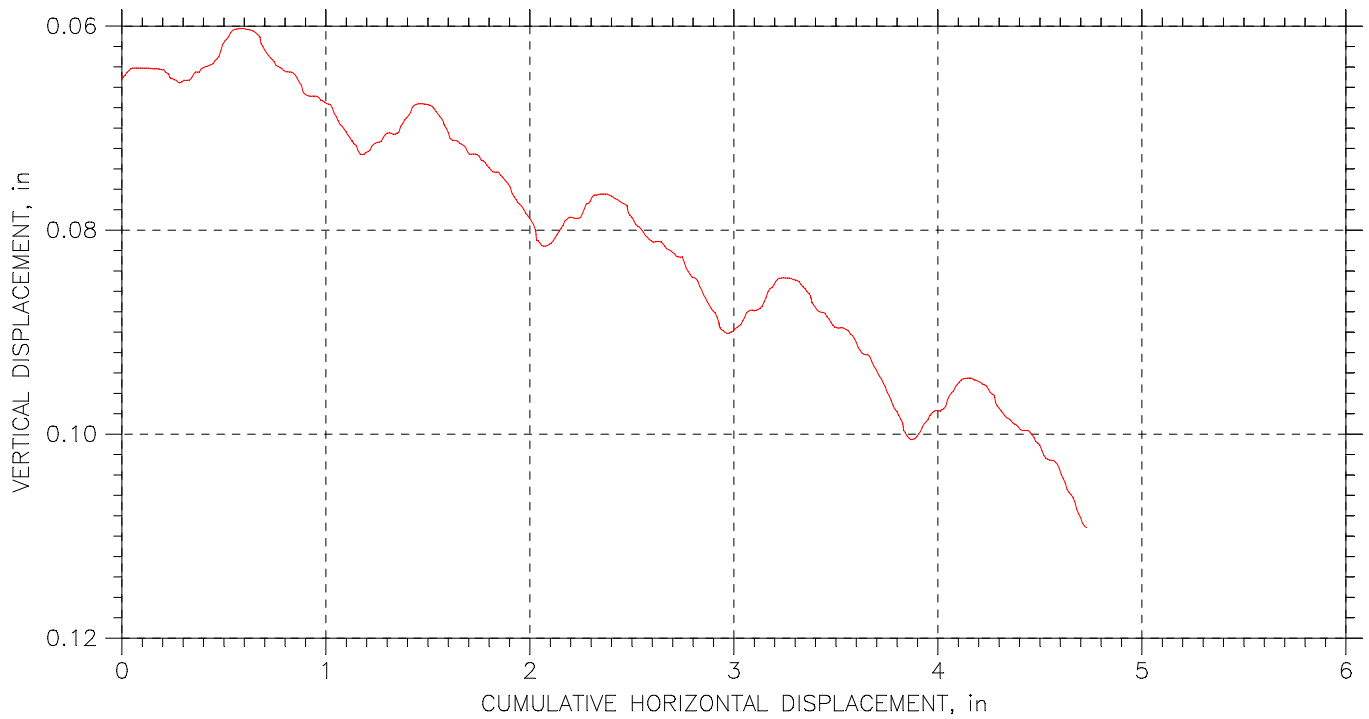
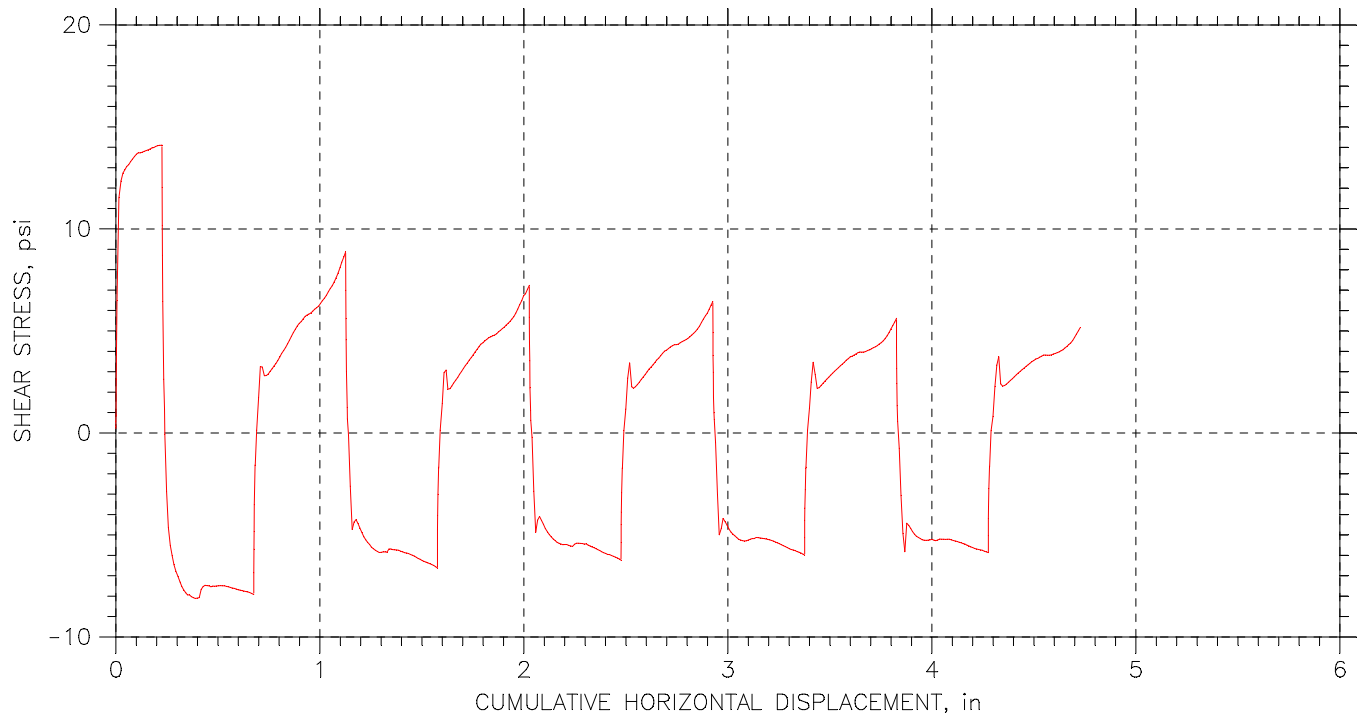
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-2	Test Date: 9/14/07	Depth: 35'-38'
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



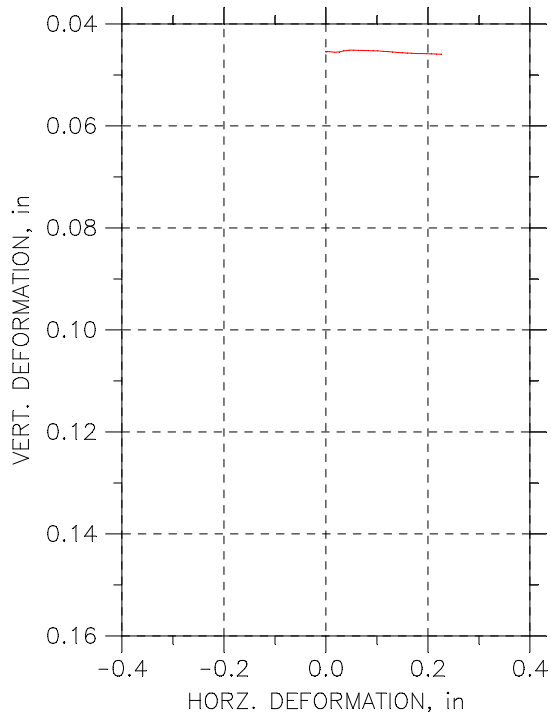
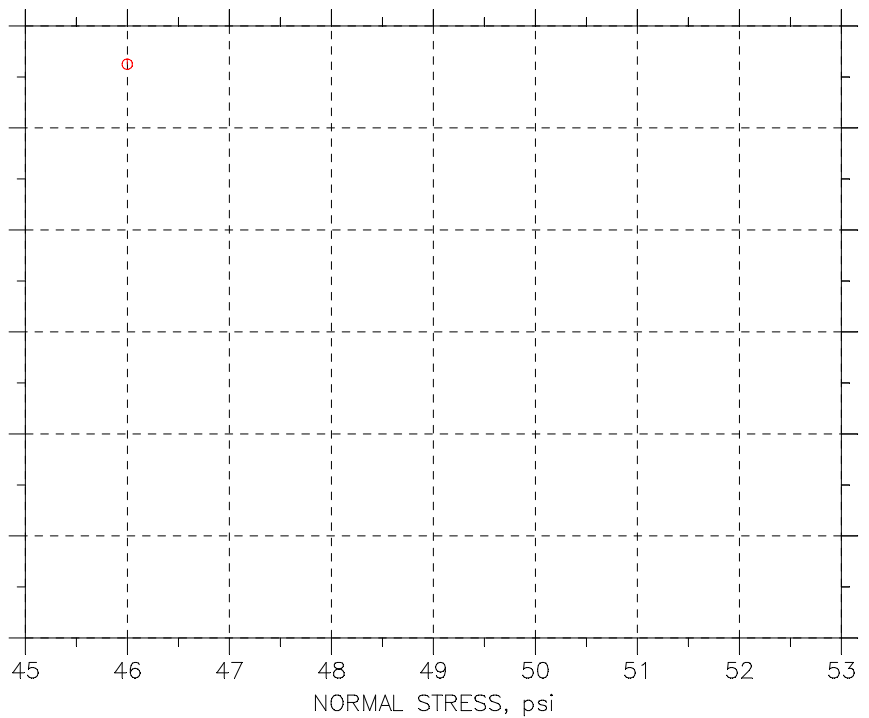
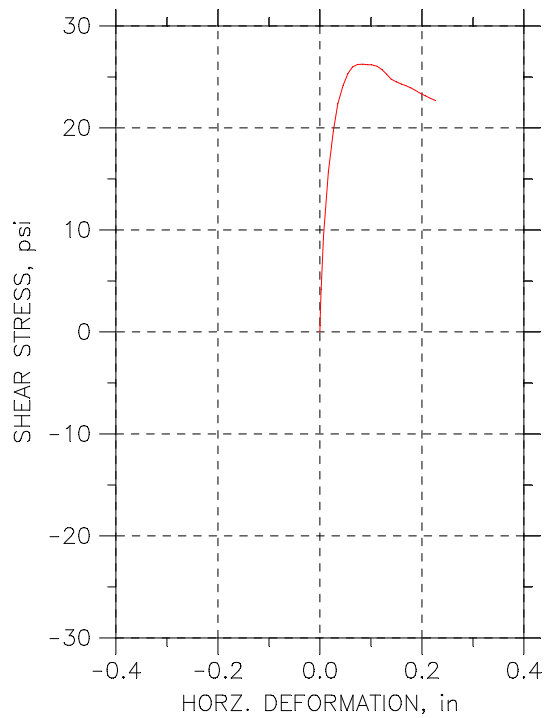
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-2	Test Date: 9/14/07	Depth:
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: Gladys A	Checked By: bert
Sample No.: P-2	Test Date: 9/14/07	Depth:
Test No.: 2	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST REPORT



Symbol				
Test No.	3			
Sample No.	P-2			
Shape	Circular			
Initial	Dimension, in	2.75		
	Area, in ²	5.9396		
	Height, in	1		
	Water Content, %	25.53		
	Dry Density, pcf	104.5		
	Saturation, %	112.34		
	Void Ratio	0.61364		
	Consol. Height, in	0.9545		
	Consol. Void Ratio	0.54022		
Final	Water Content, %	23.04		
	Dry Density, pcf	118.2		
	Saturation, %	146.09		
	Void Ratio	0.42589		
	Normal Stress, psi	45.998		
	Max. Shear Stress, psi	26.242		
	Ult. Shear Stress, psi	22.673		
	Time to Failure, min	9.0034		
	Disp. Rate, in/min	0.01		
	Estimated Specific Gravity	2.70		
	Liquid Limit	46		
	Plastic Limit	18		
	Plasticity Index	28		
Description: Moist, Stiff, Dark Gray CLAY. (CL)				
Remarks: Residual Direct Shear				

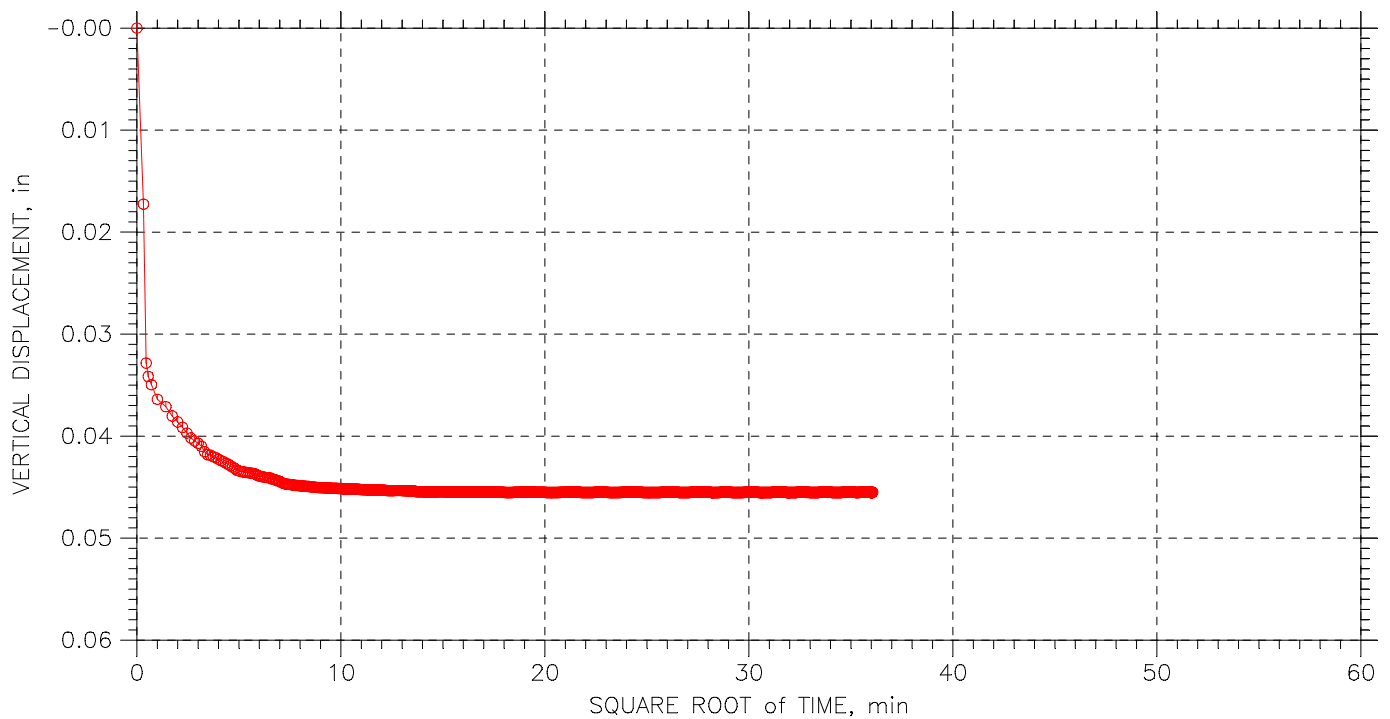
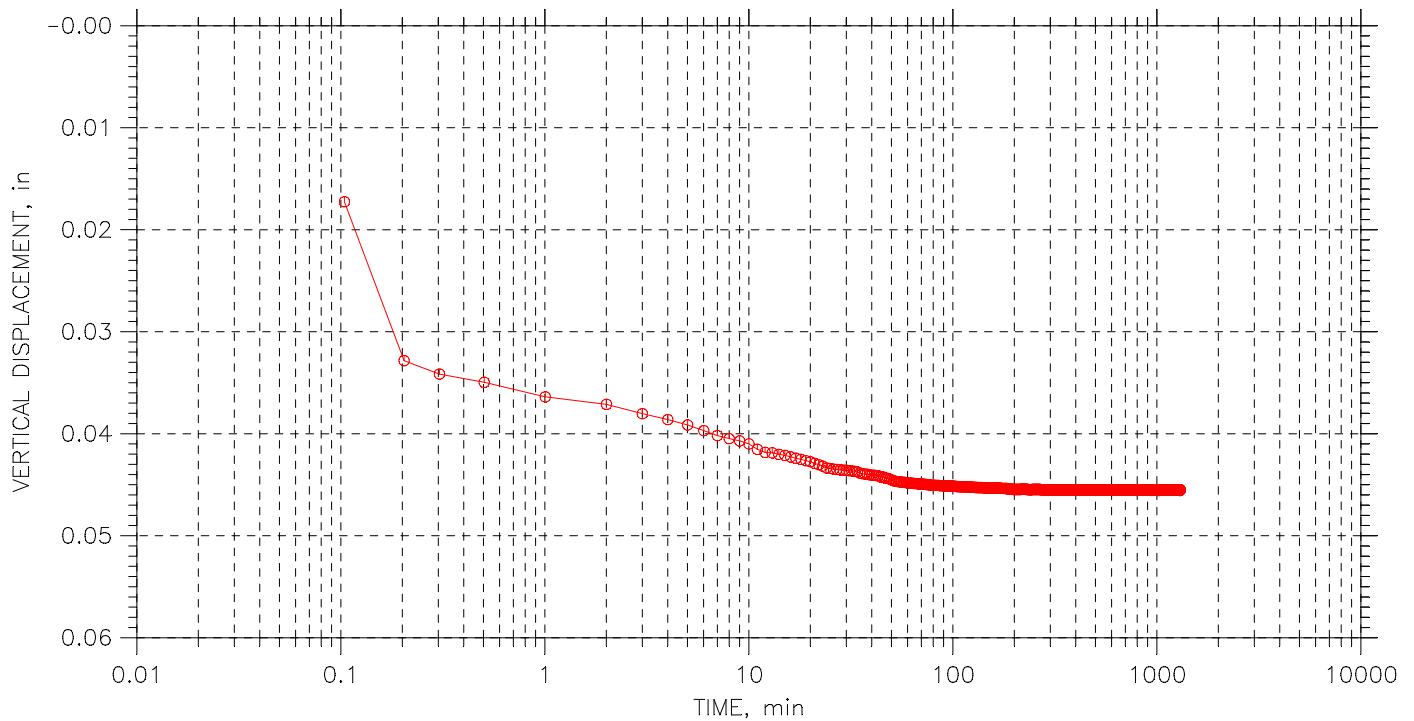
Project: Purple Line
Location: Riverdale, MD
Project No.: 14961
Boring No.: RD-3A
Sample Type: Pitcher
Description: Moist, Stiff, Dark Gray CLAY. (CL)
Remarks: Residual Direct Shear

DIRECT SHEAR TEST CONSOLIDATION DATA

TIME CURVES

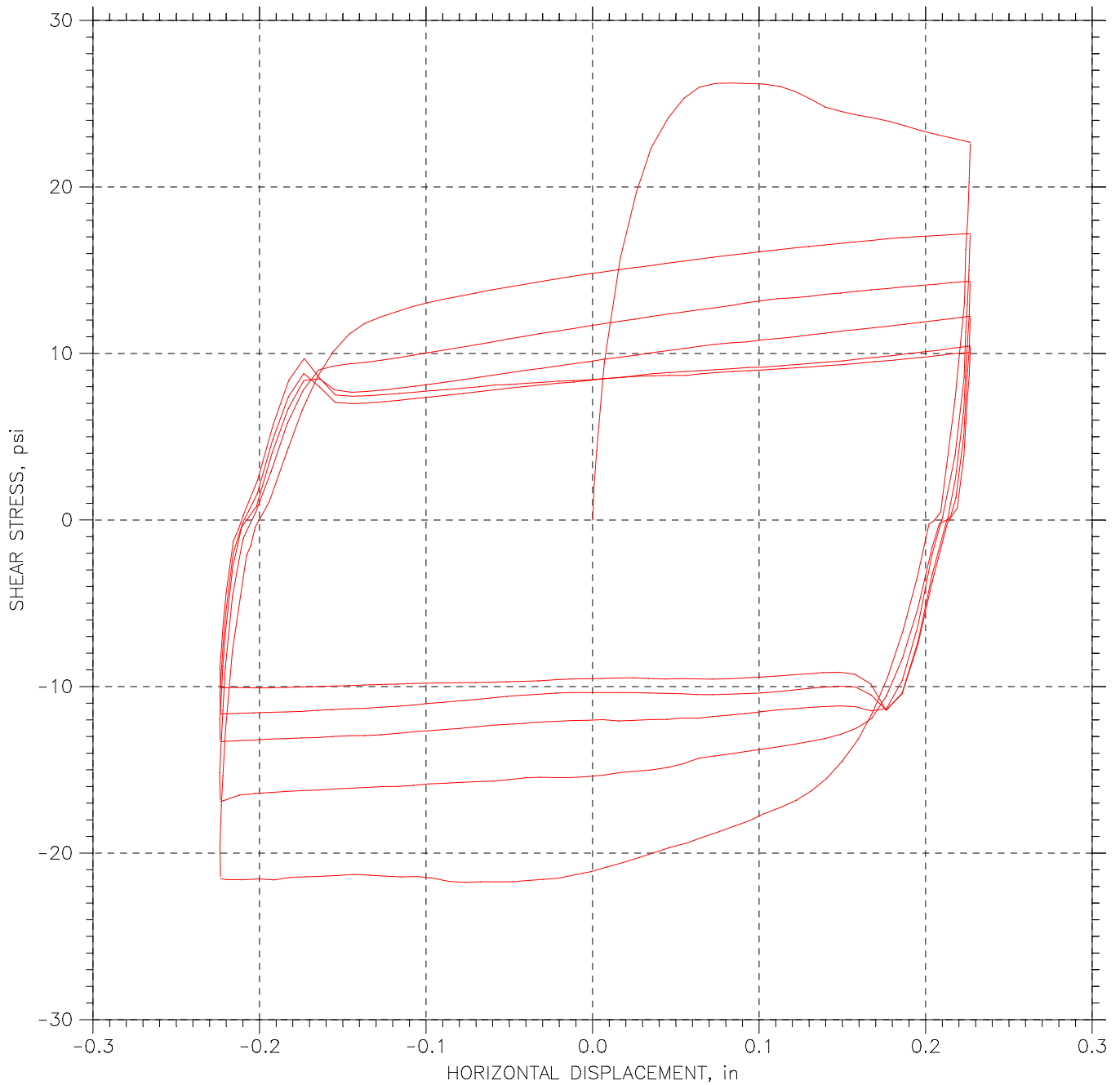
Step: 1 of 1

Stress: 46 psi



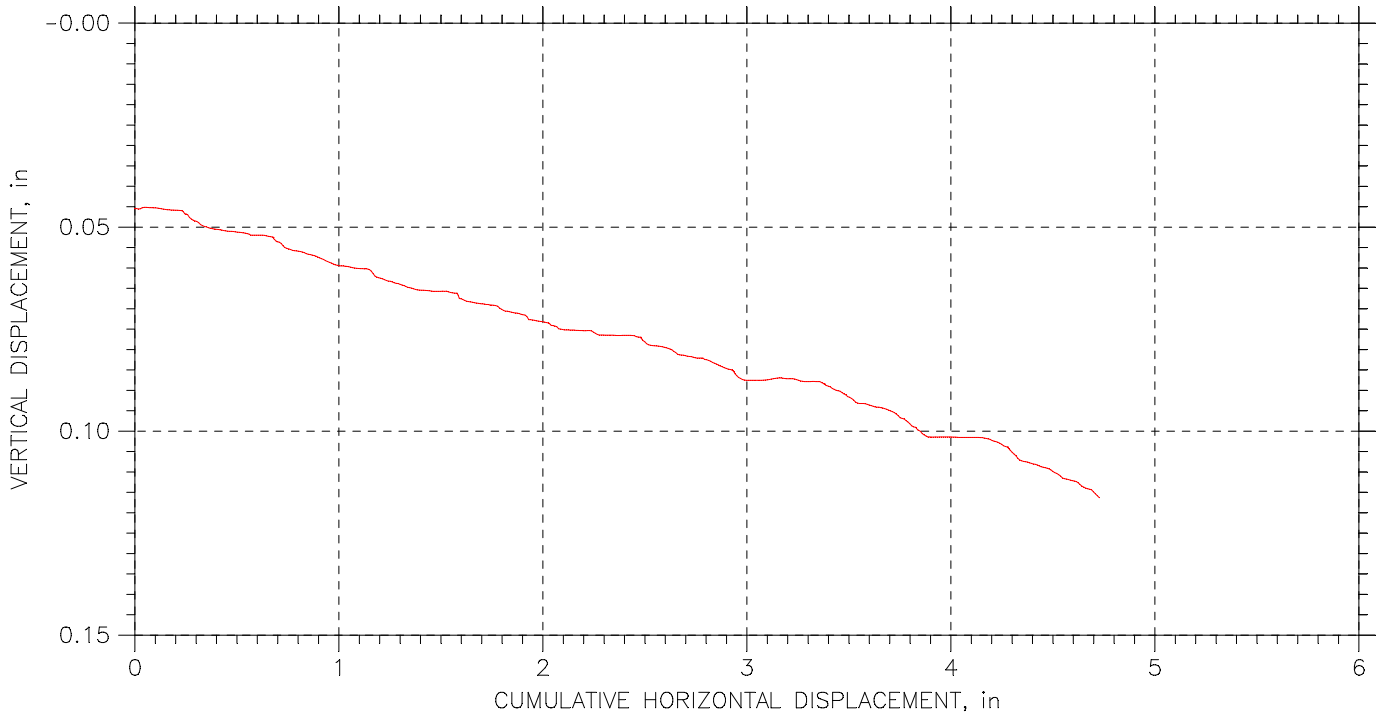
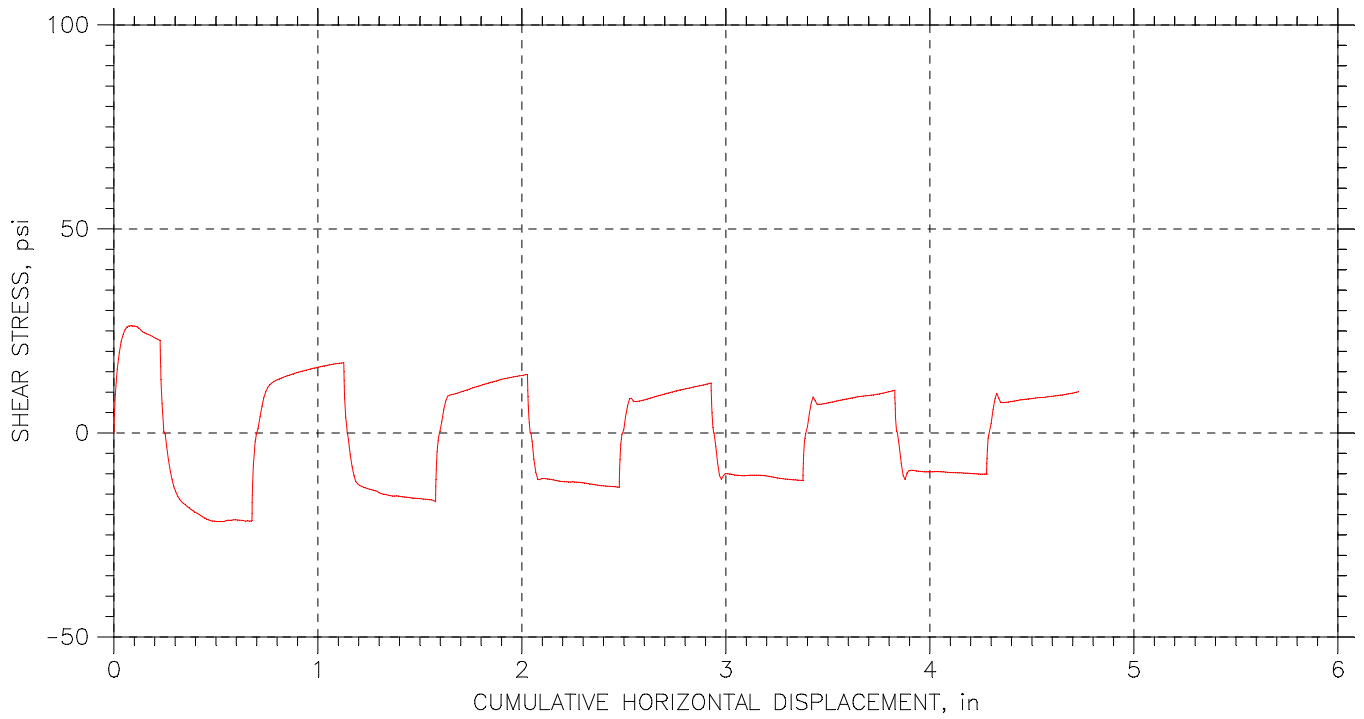
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: sam	Checked By: bert
Sample No.: P-2	Test Date: 9/14/07	Depth: 35'-38'
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



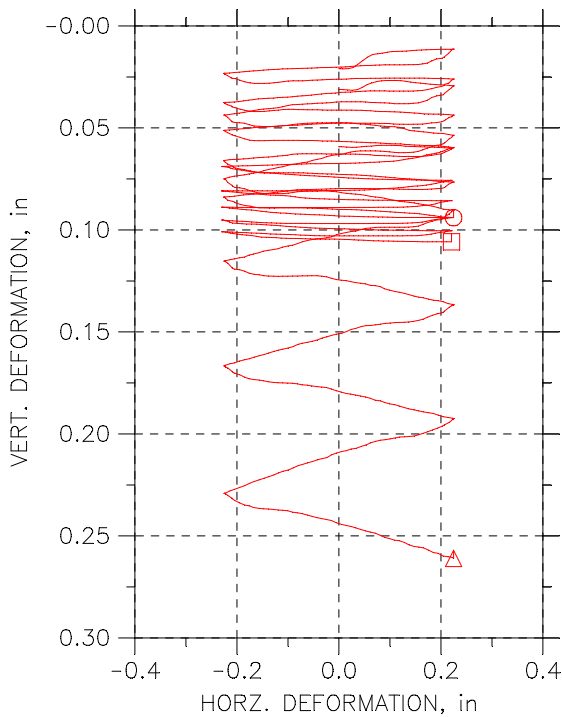
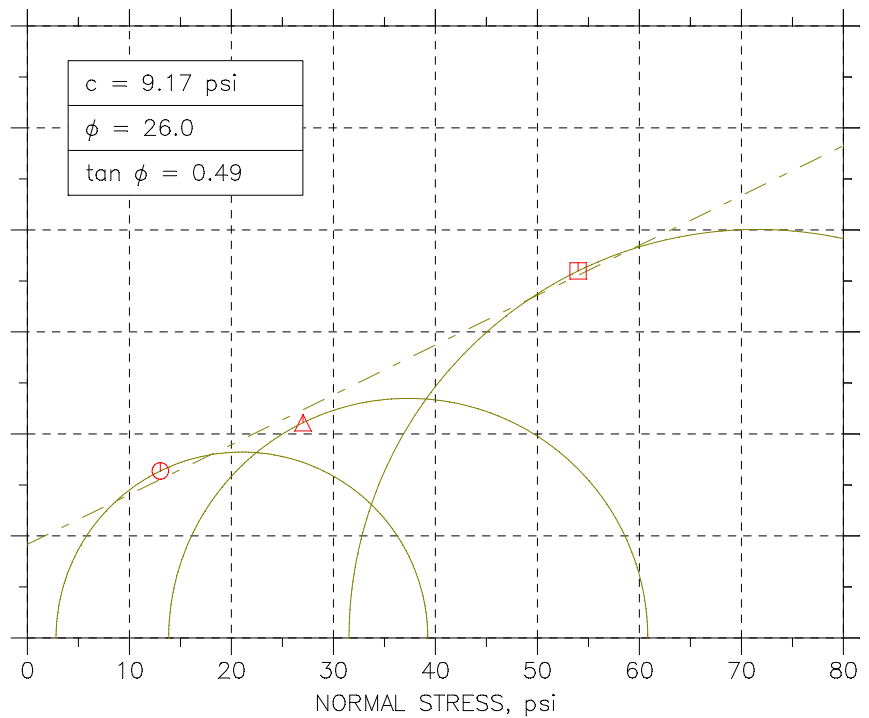
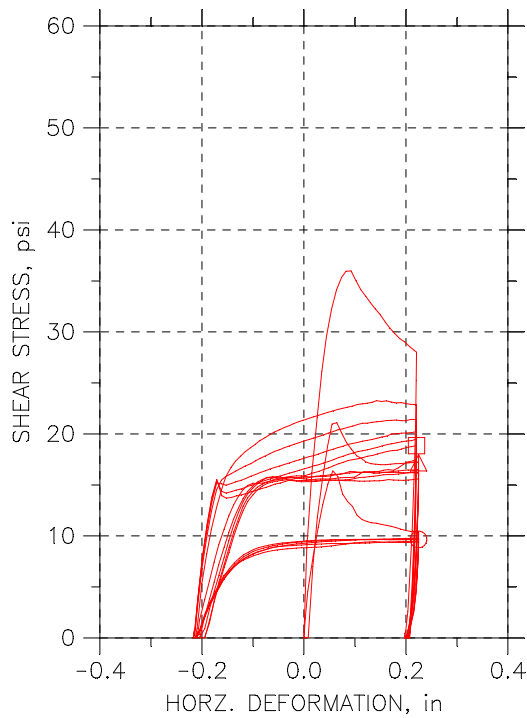
Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: sam	Checked By: bert
Sample No.: P-2	Test Date: 9/14/07	Depth:
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

RESIDUAL SHEAR TEST



Project: Purple Line	Location: Riverdale, MD	Project No.: 14961
Boring No.: RD-3A	Tested By: sam	Checked By: bert
Sample No.: P-2	Test Date: 9/14/07	Depth:
Test No.: 3	Sample Type: Pitcher	Elevation:
Description: Moist, Stiff, Dark Gray CLAY. (CL)		
Remarks: Residual Direct Shear		
File: \\Server1\Laboratory\Geocomp Software\PROJECTS\14961-0 E2CR -Purple Line\Residual Direct Shear\Residual Shear RD-		

DIRECT SHEAR TEST REPORT



Symbol	⊙	△	□	
Test No.	1	2	3	
Sample No.	P-3	P-3	P-3	
Shape	Circular	Circular	Circular	
Initial	Dimension, in	2.75	2.75	2.75
	Area, in ²	5.9396	5.9396	5.9396
	Height, in	1	1	1
	Water Content, %	28.82	32.91	24.87
	Dry Density, pcf	102.47	99.345	105.82
	Saturation, %	120.66	127.53	113.29
	Void Ratio	0.64484	0.69667	0.5928
Consol. Height, in		0.97907	0.9689	0.94085
Consol. Void Ratio		0.61042	0.64389	0.4986
Final	Water Content, %	20.51	22.29	19.30
	Dry Density, pcf	113.11	134.43	118.35
	Saturation, %	112.97	237.14	122.87
	Void Ratio	0.49022	0.25383	0.42419
Normal Stress, psi		13.029	27.027	53.994
Max. Shear Stress, psi		16.371	21.1	35.981
Ult. Shear Stress, psi		9.6556	17.175	18.847
Time to Failure, min		6.0035	7.0036	10.003
Disp. Rate, in/min		0.01	0.01	0.01
Estimated Specific Gravity		2.70	2.70	2.70
Liquid Limit		---	---	---
Plastic Limit		---	---	---
Plasticity Index		---	---	---
Description: Moist Medium Stiff Dark Clay with Some Silt and pebbles and Gravel				
Remarks: Residual Direct Shear				

Project: Purple Line
 Location: College Park
 Project No.: 14961
 Boring No.: RD-3A
 Sample Type: Pitcher

Description: Moist Medium Stiff Dark Clay with Some Silt and pebbles and Gravel
 Remarks: Residual Direct Shear